

COVERING 98% OF WORLD GROSS DOMESTIC PRODUCT AND 93% OF WORLD POPULATION



2017

INTERNATIONAL PROPERTY RIGHTS INDEX



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INTERNATIONAL PROPERTY RIGHTS

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I. PROPERTY RIGHTS: The essence of Liberty

"In a free government almost all other rights would become worthless if the government possessed power over the private fortune of every citizen"

US Supreme Court Declaration, 1897

(Chicago, Burlington & Quincy R.R. v. Chicago, 166 U.S. 226)

Property is the substance of a free society. It is the foundation of the citizenship's ability to control its own life and to strive to shape its own destiny. Property rights protect all other rights, because property enables citizens to be independent and hence capable of self-government. As Arthur Lee of Virginia stated on 1775¹:

"The right of property is the guardian of every other right and to deprive the people of this, is in fact to deprive them of their liberty".

The discussion of the role of private property is longstanding: Aristotle² (1988 [c.330BCE]) argued that private property promoted human virtues like responsibility and prudence, enhanced self-possession and therefore the practice of self-control – a positive force that suited a person for citizenship; John Locke³ linked the discussion to the state of nature and gave a moral defense of the legitimacy of unilateral appropriation in what is known as the First Occupancy theory; Hegel⁴ connected property ownership to self-development and individual freedom; while Bentham⁵ considered property as a creature of law; and John Stuart Mill⁶ defined individual property as a *"primary and fundamental institution (...) the economical arrangements of society have always rested."*

Beyond the theoretical and philosophical discussions, empirical evidence also affirms the relevance of property rights. These rights are the border guards of an individual's ability to live as they wish – they limit the power of the state to control livelihoods and impose social controls. As the Hungarian economist Janos Kornai observed:

*"The further elimination of private ownership is taken, the more consistently can full subjection be imposed"*⁷

¹ Lee, Arthur, 1775. *An appeal to the justice and interest of the people of Great Britain in the present dispute with America*, 4th edition. New York. P.14

² Aristotle, 1988 [c.330BCE]. *The Politics* Stephen Everson (ed.), Cambridge: Cambridge University Press

³ Locke, J., 1988 [1689]. *Two Treatises of Government*. Peter Laslett (ed.), Cambridge: Cambridge University Press

⁴ Hegel, G.W. F. 1967 [1821], *The Philosophy of Right*, T.M. Knox (trans.), Cambridge: Cambridge University Press

⁵ Bentham, J., 1843. *Principles of the Civil Code*. [<http://www.laits.utexas.edu/poltheory/bentham/pcc/index.html>]

⁶ Mill, J. S., 1909 [1848]. *Principles of Political Economy with some of their Applications to Social Philosophy*. W. J. Ashley (ed.) London: Longmans, Green and Co. [<http://www.econlib.org/library/Mill/mlPCover.html>]

⁷ Quoted in Skidelsky, Robert. 1997. *The Road from Serfdom*. New York: Penguin. P.99.

Equally important, are those observations that relate to the relevance of private property as the most important bulwark of privacy. As Chicago's University Professor, Richard Epstein, expresses "*private property gives the right to exclude others without the need for any justification. Indeed, it is the ability to act at will and without need for justification within some domain which is the essence of freedom, be it of speech or of property*"⁸, showing that unavoidable link between property and liberty.

One of the most fertile and complex areas of debate around property rights is liberty. In this sense, creating a property system becomes a highly useful institution for a society, as it works to protect and to foster individual liberty.⁹ In this view, individual liberty is the most important appropriation a system of property rights must protect, following the creation of the moral consciousness and the essence of our symbolic values that frame our sense of living.

Following Hayek¹⁰ in *The Constitution of Liberty*, we should define at least two terms, Freedom: as the ability to do what we consider right (innate); and Liberty: as the government concession of freedom, creating the opportunity to exercise social rights. Hayek also differentiates between liberty: the ability to do everything that is not forbidden, and liberties: the prohibition of everything that is not explicit. Hayek favors the negative concept of freedom (avoiding discretionary coercion) as the concept becomes positive when it is exercised. Liberty does not assure any special opportunity; it leaves to our discretion the decision related to the use we will make of the circumstances in which we find ourselves. This way, liberty produces more benefits for the discipline it imposes than for the opportunities it offers.

On the other hand, property is the basis of freedom of contract, which is simply liberty in action. Without freedom to exchange, a third party, generally the government, places all exchanges at the discretion of the political-bureaucratic ruling class. Freedom is more than the right to own property or the right to make transactions, to exchange, to buy and sell. But once the citizens lose the right to own they drop the ability to control their own lives¹¹. Property rights and market economies are vital rocks to political freedom. Private property gives people a place to stand if they must resist the government. Market economies and private property allow citizens to build up resistance to government pressure.

This way property rights nurture economic growth and social development. As property rights engender innovation and productivity they are the most effective mechanism to guarantee civil rights and civil liberties, giving rise to what Pipes¹² defines as the co-sovereign citizen, as in modern democratic and liberal republics sovereignty is also an attribute of citizenship and not only of the nation-state.

Finally, it should be noted that property rights are human rights. Private property rights are the rights of humans to use specified goods and to exchange them. Any restraint on private property rights shifts the balance of power from impersonal attributes toward personal attributes and toward behavior that political authorities approve. That is a fundamental reason for preference of a system favoring strong private property rights: private property rights protect individual liberty.¹³

⁸ Epstein, Richard 1985. *Takings*. Cambridge, Mass.: Harvard University Press. P. 66.

⁹ Freyfogle, E.T., 2010. "Property and Liberty" *Harvard Environmental Law Review* Vol.34(1):75-118 [<http://ssrn.com/abstract=1024574> or <http://dx.doi.org/10.2139/ssrn.1024574>]

¹⁰ Hayek, F.A. 1996[1959] "Libertad y Libertades" in *Los Fundamentos de la Libertad*, Barcelona: Unión Editorial. Cap. 1, pp.31-46 (*The Constitution of Liberty*)

¹¹ Bovard, James 2000. *Property and Liberty*. Foundation for Economic Education. Articles (Justice) Sep. 01, 2000. (<https://fee.org/articles/property-and-liberty/>)

¹² Pipes, R., 1999. *Property and Freedom*. New York: Alfred A. Knopf and London: The Harvill Press.

¹³ Alchian, Armen A. Property Rights (<http://www.econlib.org/library/Enc/PropertyRights.html>)

As described previously, the property rights are more than the mere ownership of things. By being connected to liberty property rights allow individuals and societies to express their values and beliefs in the world, creating prosperity and the creation of a virtuous circle for human life in society.

II. IPRI Structure

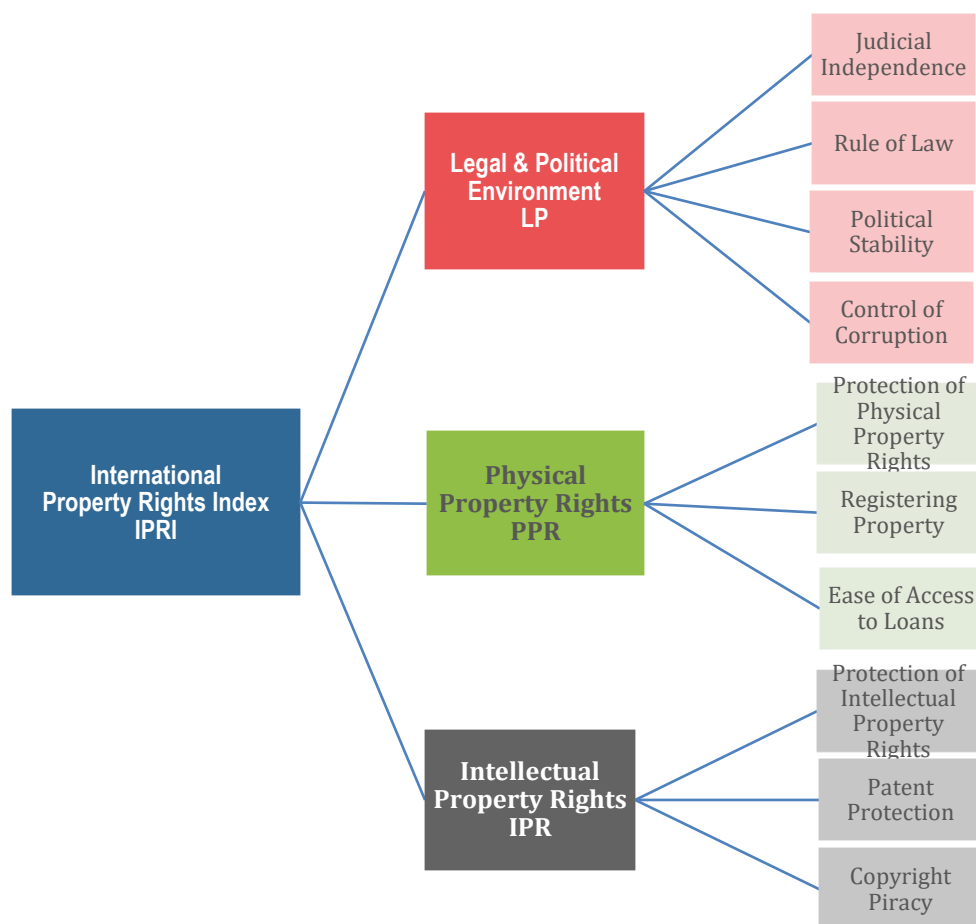
Since 2007, Property Rights Alliance (PRA) - dedicated to the protection of property rights all around the world - instituted the Hernando de Soto fellowship to produce a yearly edition of the International Property Rights Index, IPRI.

The IPRI was developed to serve as a barometer for the status of property rights across the world. A vast review of the literature on property rights was done in order to conceptualize and operationalize a comprehensive characterization of property rights. Following convention set in place by previously compiled indexes, several experts and practitioners in the field of property rights were consulted to finalize the set of core categories (here-after referred to as “components” or ‘sub-indexes’) and the items that create the components.

The following are the three core components of the IPRI:

1. Legal and Political Environment, LP
2. Physical Property Rights, PPR
3. Intellectual Property Rights, IPR

FIGURE 1. IPRI Structure



The Legal and Political Environment (LP) component provides an insight into the strength of governance institutions of a country, the respect for the 'rules of the game' among citizens; consequently, the measures used for the LP are broad in scope. This component has a significant impact in the development and protection of physical and intellectual property rights.

The other two components of the index - Physical and Intellectual Property Rights (PPR and IPR) - reflect two forms of property rights, both of which are crucial to the economic development of a country. The items included in these two categories account for both *de jure* rights and *de facto* outcomes for the countries considered.

The IPRI is comprised of 10 items in total, each gathered under one of the three components: LP, PPR, or IPR. While there are numerous items related to property rights, the final IPRI is specific to the core factors that are directly related to the strength and protection of physical and intellectual property rights, and the political institutions responsible for their protection. Furthermore, items for which data was available more regularly and in a greater number of countries were given preference. This was done to ensure that scores were comparable across countries and years.

The IPRI-2017, the eleventh edition, keeps the previous years' methodology to allow for a full comparison of its results with previous editions.

II.1 Legal and Political Environment

The Legal and Political Environment component grasps the ability of a nation to enforce a *de jure* system of property rights and for that four items or indicators are considered: the independence of its judicial system, the strength of the rule of law, control of corruption, and the stability of its political system.

Judicial Independence

This item examines the judiciary's freedom from influence by political, individual or business groups. The independence of the judiciary is a central underpinning for the sound protection and sovereign support of the court system with respect to private property.

For this item, the chosen data source was the Global Competitiveness Index from the World Economic Forum's 2016-2017 (<http://bit.ly/2lHs5Mn>). The original data scale is [1 - 7], where 7 is the best score. The full question and associated answers of the Executive Opinion Survey for this indicator was:

In your country, how independent is the judicial system from influences of the government, individuals, or companies? [1= not independent at all; 7 = entirely independent]

Rule of law

This item measures the extent to which agents have confidence in and abide by the rules of society. In particular, it measures the quality of contract enforcement, property rights, police, and courts, as well as the likelihood of crime and violence.

The item combines several indicators that include: fairness, honesty, enforcement, speed, affordability of the court system, protection of private property rights, and judicial and executive accountability. This item complements the Judicial Independence variable.

For this indicator, the chosen data source was the World Bank Worldwide Governance Indicators, 2015 (<http://bit.ly/1rwwuAb>). The original data scale is [-2.5 to 2.5], where 2.5 was the best score.

Political Stability

The degree of political stability influences incentives to obtain or to extend ownership and/or management of property. The higher the likelihood of government instability, the less likely people will be to obtain property and to develop trust in the validity of the rights attached.

For this item, the chosen data source was the World Bank Worldwide Governance Indicators, 2015 (<http://bit.ly/1rwwuAb>). The original data scale is [-2.5 to 2.5], where 2.5 was the best score.

NOTE: A special warning must be made regarding the Political Stability indicator, since this year it presents a value outside its normal range for a country (Yemen -2.63). This country value was considered as an extreme of the range scale (minimum value) for the rescaling process.

Control of corruption

This item combines several indicators that measure the extent to which public power is exercised for private gain. This includes petty and grand forms of corruption, as well as the ‘capture’ of the state by elites and private interests. As with the other items in the LP component, corruption influences people’s confidence in the existence of sound implementation and enforcement of property rights. Corruption reflects the degree of informality in the economy, which is a distracting factor to the expansion of respect for legal private property.

The research by Dong and Torgler (2011) supports these ideas. They provide theoretical and empirical evidence of 108 countries from 1995-2006, showing that the effects of democratization on control of corruption depend on the protection of property rights and income equality, creating in this way a virtuous circle.

The data source chosen for this item was the World Bank Worldwide Governance Indicators, 2015 (<http://bit.ly/1rwwuAb>). The original data scale is [-2.5 to 2.5], where 2.5 was the best score.

II.2. Physical property rights (PPR)

A strong property rights regime must earn the confidence of people in its effectiveness to protect private property rights. It also provides for unified transactions related to the registry of property and it allows access to the required credit to convert property into capital. For these reasons, the following items are used to measure private property rights protection (PPR).

Protection of Physical Property Rights

The Protection of Physical Property Rights relates directly to the strength of a country's property rights system based on the expert's views of the quality of the judicial protection of private property, including financial assets. Additionally, it encompasses the expert's opinion on the clarity of the legal definition of property rights.

The data source to measure this item was the World Economic Forum's 2016-2017 Global Competitiveness Index of the (<http://bit.ly/2lHs5Mn>). The original data scale is [1 - 7], where 7 is the best score. The full question and associated answers of the Executive Opinion Survey for this indicator was:

In your country, to what extent are property rights, including financial assets, protected? [1 = not at all; 7 = to a great extent]

Registering Property

This item measures the number of days and procedures necessary to register a property according to the formal government ledger system. It records the full sequence of procedures necessary to transfer the property title from seller to buyer when a business purchases land or a building. This information is critical because the more difficult property registration is, the more likely it is that assets stay in the informal sector, thus restricting the development of the broader public's understanding and support for a strong legal and sound property rights system. Moreover, registration barriers discourage the movement of assets from lower to higher valued uses.

The Registering Property indicator reflects one of the main economic arguments set forth by Hernando de Soto: *"what the poor lack is easy access to the property mechanisms that could legally fix the economic potential of their assets so they could be used to produce, secure or guarantee greater value in the extended market"* (2000:48). This item is calculated as:

$$\text{Registering Property} = 0.7 * \text{\#days} + 0.3 * \text{\#procedures}$$

The data source chosen for measuring this item was The World Bank Group's 2017 Doing Business Report (<http://bit.ly/2mm9poK>). The original data scale is [1- ∞], where 1 is the best score.

Ease of Access To Loans

Access to a bank loan without collateral serves as a proxy for the level of development of financial institutions in a country. Financial institutions play an integral role in a strong property rights system, they bring economic assets into the formal economy. An important channel trying to alleviate poverty have been credit facilities. Singh and Huang¹⁴ conducted a study of 37 countries in Sub-Saharan Africa from 1992-2006 and concluded that not only do property rights reinforce the effect of narrowing inequalities with financial deepening, but that in their absence, it could be in detrimental to the poor.

¹⁴ Huang, Yifei and Singh, Raju Jan 2011. *Financial Deepening, Property Rights and Poverty: Evidence from Sub-Saharan Africa*. IMF Working Papers. Pp 1-31

The data chosen for this item was the Global Competitiveness Index of the World Economic Forum's 2016-2017 (<http://bit.ly/2lHs5Mn>). The original data scale is [1 - 7], where 7 is the best score. The full question and associated answers of the Executive Opinion Survey for this indicator was:

In your country, how easy is it for businesses to obtain a bank loan? [1 = extremely difficult; 7 = extremely easy]

II.3.- Intellectual Property Rights

The Intellectual Property Rights component evaluates the protection of intellectual property. In addition to an opinion-based measure of the protection of intellectual property, it assesses protection of two major forms of intellectual property rights (patents and copyrights) from *de jure* and *de facto* perspectives, respectively.

Protection of Intellectual Property Rights

This indicator captures a nation's protection of intellectual property; therefore, it is a crucial aspect of the IPR component. The data source chosen for this item was the World Economic Forum's 2016-2017 Global Competitiveness Index (<http://bit.ly/2lHs5Mn>). The original data scale is [1 - 7], where 7 was the best score. Its Executive Opinion Survey used the following question and associated answers:

In your country, to what extent is intellectual property protected? [1 = not at all; 7 = to a great extent]

Patent Protection

This item reflects the strength of a country's patent laws based on five extensive criteria: coverage, membership in international treaties, restrictions on patent rights, enforcement, and duration of protection. The data used for this item came from Ginarte-Park Patent Protection (1960-2010, International Patent Protection: 1960-2005, Research Policy, 2008, Vol. 37(4):761-766. Specific Source: <http://bit.ly/2mlyH1J> Data: 2010). The original data scale is [0 - 5], where 5 was the best score. While this source is updated on a quinquennial basis, the next data release will occur in 2017.

Copyright Piracy

The level of piracy in the IP sector is an important indicator of the effectiveness of the intellectual property rights enforcement in a country. The data source chosen for this item was the BSA Global Software Survey; The Compliance Gap (2016 edition, <http://bit.ly/1TXs7i0>) which estimates the volume and value of unlicensed software installed on personal computers, and also reveals attitudes and behaviors related to software licensing, intellectual property and emerging technologies. The original data scale is [0 - 100%], where 0 was the best score.

III. Methodology

The IPRI's 2017 scores and rankings are based on data obtained from official sources made publicly available by established international organizations (see Appendix I). This means that most data is provided in different styles and on different scales. Consequently, the data is rescaled in order to accurately compare among countries and within IPRI's individual components and the overall score. The overall grading scale of the IPRI ranges from [0 - 10], where 10 is the highest value for a property rights system and 0 is the lowest value (i.e. most negative) for a property rights system within a

country. The same interpretative logic is applied to the three components and to the 10 items or indicators. While the average mechanisms applied assume equal importance for each component of the final IPRI score (and also of each item for each component), some weights could be applied to evaluate the relative importance of the different aspects of a property rights system of a country.

The IPRI for 2017 uses data from the 2010 – 2017 period. The 10 items are collected from different sources, which imply that they have different accessibility times for the most updated data available. The applied logic in the analysis has been to include the latest available data sets for the 2017 IPRI. Most of the items present a lag of 1 year (see Appendix I), so the time difference among data, should not affect our analysis. Almost all the items needed to be rescaled to the IPRI range. The rescaling process was done as follow:

1. For bounded data series with same direction:

$$\left[\frac{\text{Country Value} - \text{MIN Original Scale}}{\text{MAX Original Scale} - \text{MIN Original Scale}} * (\text{MAX New Scale} - \text{MIN New Scale}) \right] + \text{MIN New Scale}$$

2. For unbounded data series with same direction:

$$\frac{(\text{MAX Value of data serie} - \text{Country Value})}{(\text{MAX Value of data serie} - \text{MIN Value of data serie})} * 10$$

3. For bounded data series with inverse direction:

$$10 - \left[\frac{\text{Country Value} - \text{MIN Original Scale}}{\text{MAX Original Scale} - \text{MIN Original Scale}} * (\text{MAX New Scale} - \text{MIN New Scale}) \right] + \text{MIN New Scale}$$

IPRI Calculations

$$LP = \frac{\text{Judicial independence} + \text{Rule of Law} + \text{Political Stability} + \text{Control of Corruption}}{\# \text{ Items}}$$

$$PPR = \frac{\text{Property Rights} + \text{Registering Property} + \text{Ease Access Loans}}{\# \text{ Items}}$$

$$IPR = \frac{\text{Intellectual Property Protection} + \text{Patent Protection} + \text{Copyright Piracy Level}}{\# \text{ Items}}$$

$$IPRI = \frac{LP + PPR + IPR}{3}$$

After calculating the score of the IPRI and its components, countries were ranked according to their scores. With some frequency, a few countries can exhibit almost the same score and they will be placed in the same rank. This way, i.e., Country A could be ranked #1, while Country B and Country C #2, and Country X, Country Y and Country Z are #3. To minimize this situation and a diffusion bias, ranking calculations were made using IPRI scores with all their decimals, this way the final scores were differentiated, and such were the ranking positions.

III.1. Countries and Groups

The 2017 IPRI ranks a total of 127 countries. This year there are four countries that were part of the index last year but they are not included in this year's index: Guyana, Haiti, Myanmar and Swaziland. While three were added: Brunei Darussalam, Democratic Republic of Congo, and Republic of Yemen.

The selection of countries was determined only by the availability of the required data. In order to keep the meaningfulness of the data and analysis, only country-year combinations respecting specific rules have been considered.

Since the 6th edition of the IPRI the rule of two-thirds was implemented signifying the least amount of data required for each component to make it into the index. Or, more specifically, if a country does not have data available for at least 3 items in the LP component, 2 items in the PPR component, and 2 items in IPR component, it has to be excluded from the analysis.

All countries were grouped following different criteria (Appendix II):

1. Geographical regions: Latin America and Caribbean, Western Europe, Central Eastern Europe and Central Asia, Middle East and North Africa, Africa, Asia and Oceania, and North America
2. Income classification, according to the World Bank, July 2016 update: High income, Upper-Middle-Income, Lower-Middle-Income, and Low-Income.
3. Regional and Development classification, according to the International Monetary Fund as of April, 2016: Advanced Economies; Commonwealth of Independent States; Emerging and Developing Asia; Emerging and Developing Europe; Latin America and the Caribbean; Middle East, North Africa, Afghanistan and Pakistan; and Sub-Saharan Africa.
4. Economic and Regional Integration Agreements: Organization for Economic Co-operation and Development, European Union, Southern African Development Community, Economic Community of Western African States, Association of Southeast Asian Nations, Central American Parliament, Gulf Cooperation Council, Pacific Alliance, southern Common Market, South Asian Association for Regional Cooperation, Central African Economic and Monetary Community, Central American Common Market, Commonwealth of Independent States, Arab Maghreb Union, Caribbean Community, Andean Community, European Free Trade Association, Intergovernmental Authority on Development, North American Free Trade Agreement, Organization of the Petroleum Exporting Countries, Economic Community of Central African States and Trans-Pacific Partnership.

IV. IPRI 2017 Country Results

This section presents the results of the 2017 International Property Rights Index. Starting with the scores of the overall IPRI and its three (3) components, we follow with detail rankings of the IPRI and its components. Then, movement between the 2016 and 2017 editions, of both individual IPRI components and of the overall IPRI score, are presented. This chapter also includes an analysis of the IPRI for country groups.

As an average, the sample of the 127 countries this year yielded an IPRI score of 5.63, where the Legal and Political Environment (LP) was the weakest component with a score of 5.17, followed by the Intellectual Property Rights (IPR) component with a score of 5.50, and the Physical Property Rights (PPR) was the strongest component with a score of 6.23. For the third consecutive year we found an overall improvement of the average IPRI score and for all components (see Table 1).

Table 1. Average Score: IPRI and its Components 2015-2017

	IPRI	LP	PPR	IPR
2015	5.30074	4.99304	5.76678	5.14241
2016	5.44588	5.13028	5.87459	5.33276
2017	5.63357	5.17152	6.22653	5.50267

Using SPSS® a normality test was run for IPRI and its components, it showed a Gaussian behavior. All of them showed unimodal distributions (see Table 2, Table 3 and Figure 1).

Table 2. Statistics: IPRI and its Components. 2017

		IPRI	LP	PPR	IPR
N	Valid	127	127	127	127
	Missing	0	0	0	0
Mean		5.63357244	5.17152126	6.22652677	5.50267008
Std. Error of Mean		.133172391	.162104523	.121291880	.146484361
Median		5.33090000	4.73460000	6.23010000	5.22130000
Std. Deviation		1.500776625	1.826825194	1.366890064	1.650794907
Variance		2,252	3,337	1,868	2,725
Range		5.905400	7.351600	5.565700	7.008000
Minimum		2.728100	1.679500	3.259800	1.707500
Maximum		8.633500	9.031100	8.825500	8.715500
Percentiles	25	4.58260000	3.81270000	5.13460000	4.36160000
	50	5.33090000	4.73460000	6.23010000	5.22130000
	75	6.61020000	6.53470000	7.37720000	6.61080000

Table 3. Tests of Normality: One-Sample Kolmogorov-Smirnov Test

		IPRI	LP	PPR	IPR
N		127	127	127	127
Normal Parameters ^{a,b}	Mean	5.63357244	5.17152126	6.22652677	5.50267008
	Std. Deviation	1.500776625	1.826825194	1.366890064	1.650794907
Most Extreme Differences	Absolute	,109	,126	,061	,088
	Positive	,109	,126	,050	,088
	Negative	-,074	-,070	-,061	-,088
Kolmogorov-Smirnov Z		1,233	1,416	,689	,991
Asymp. Sig. (2-tailed)		,095	,036	,729	,279

a. Test distribution is Normal. b. Calculated from data.

FIGURE 2. Histogram: PRI and its components 2017

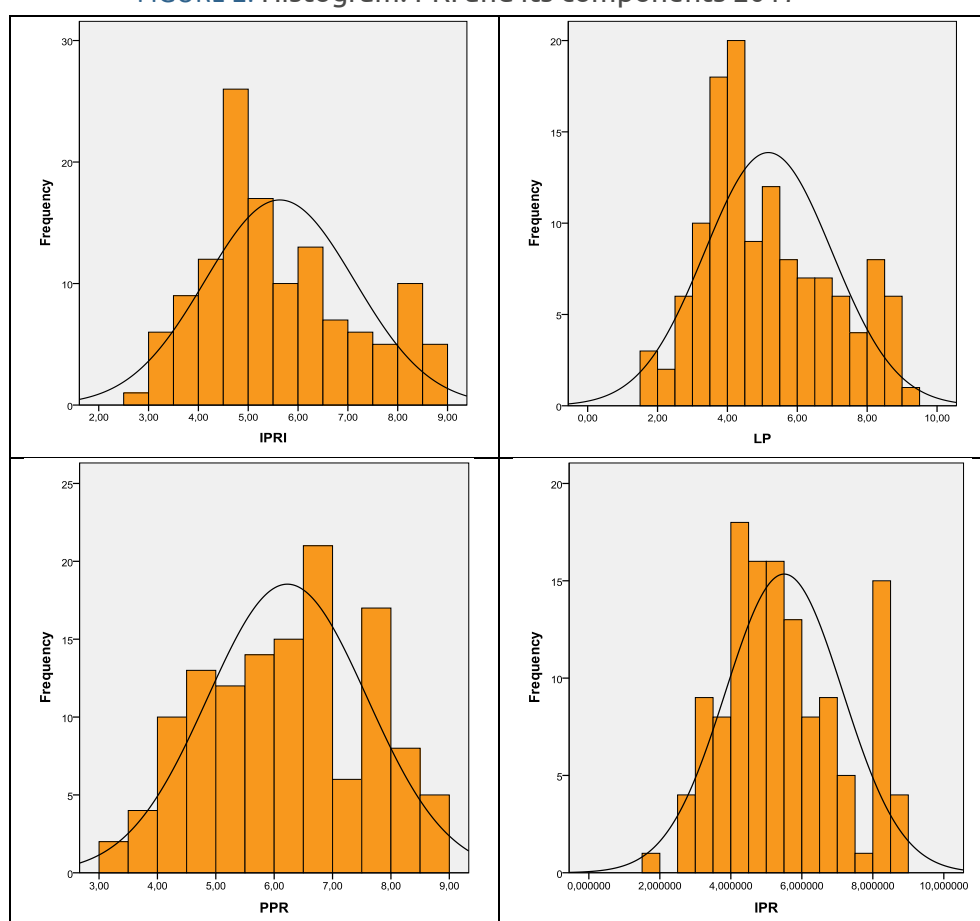


Table 4 shows -alphabetically ordered- the score value of the 127 countries included in the IPRI 2017, as the scores of its components: Legal and Political Environment (LP), Physical Property Rights (PPR) and Intellectual Property Rights (IPR). Figure 3 displays countries organized by their IPRI scores from ranked from highest to lowest.

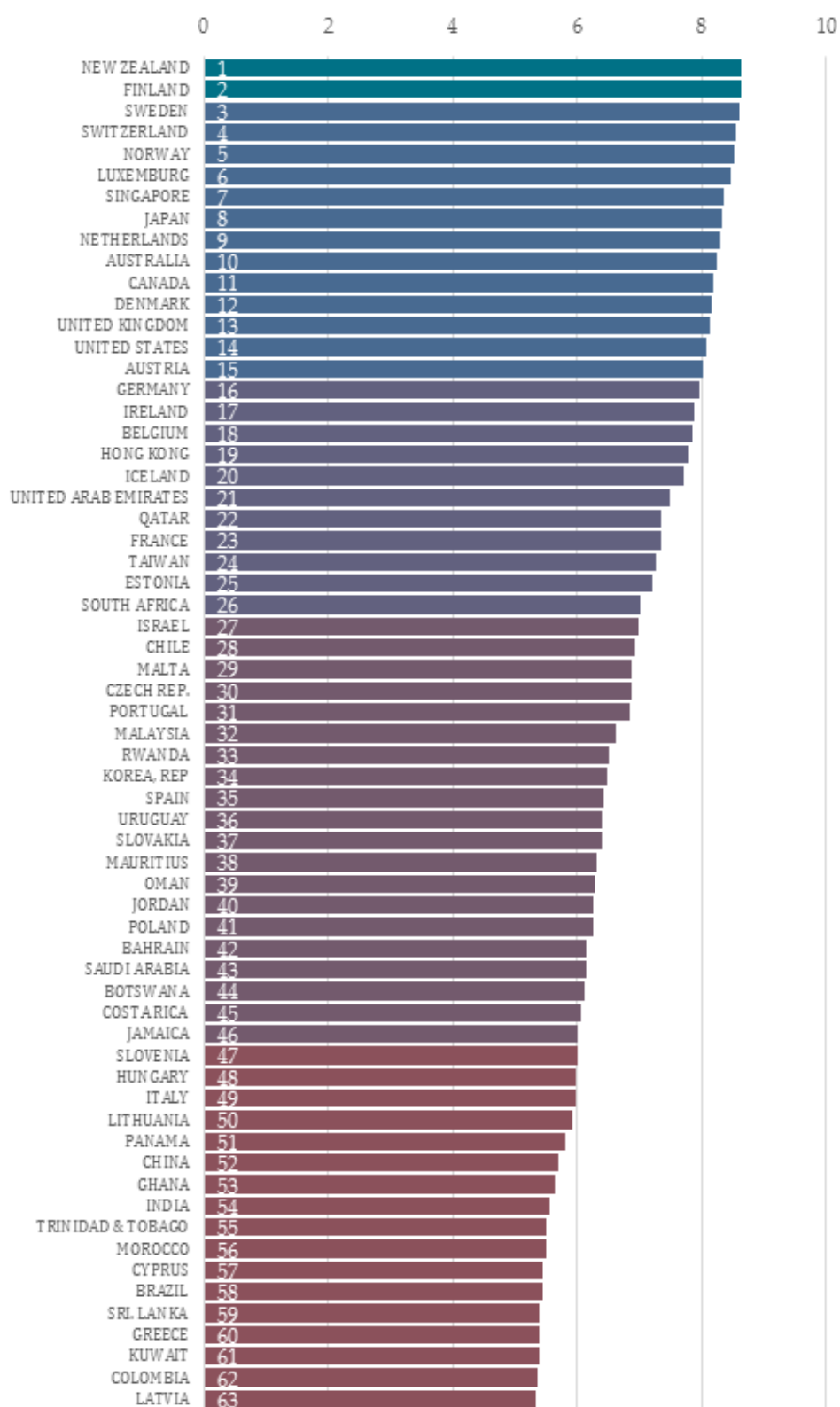
Table 5 shows the IPRI 2017 rankings by quintile for all the 127 countries in our sample. In general, the number of countries belonging to each quintile increases from the top 20% to the bottom 20% (1st quintile 17 countries, 2nd quintile 22 countries, 3rd quintile 25 countries, 4rd quintile 29 countries

and 5th quintile 36 countries). Hence, the fourth and the fifth quintiles include 65 countries which is 50.18% of our sample, while the first three quintiles includes almost the same amount, 64 countries, being the 50.39% of the sample.

Table 4. IPRI 2017. IPRI and its Components Scores by Country

COUNTRY	Rank	IPRI	LP	PPR	IPR	COUNTRY	Rank	IPRI	LP	PPR	IPR	COUNTRY	Rank	IPRI	LP	PPR	IPR
ALBANIA	118	3.8223	4.2412	3.9405	3.2854	GREECE	60	5.3887	4.9469	5.1937	6.0255	OMAN	39	6.2797	5.9750	7.6701	5.1941
ALGERIA	106	4.1603	3.5344	5.1955	3.7512	GUATEMALA	71	5.0768	3.5911	6.9604	4.6790	PAKISTAN	121	3.4743	2.8390	4.2351	3.3487
ARGENTINA	97	4.5683	3.8127	5.0544	4.8378	HONDURAS	80	4.9018	3.5771	6.5373	4.5910	PANAMA	51	5.7982	4.5292	7.5795	5.2859
ARMENIA	107	4.1261	4.1441	5.1736	3.0606	HONG KONG	19	7.7856	8.2339	7.8514	7.2716	PARAGUAY	100	4.4778	3.4330	6.2234	3.7770
AUSTRALIA	10	8.2435	8.2716	8.2386	8.2204	HUNGARY	48	5.9919	5.2857	6.1786	6.5113	PERU	65	5.2173	3.8597	6.8331	4.9591
AUSTRIA	15	8.0122	7.8543	7.9702	8.2121	ICELAND	20	7.6996	8.1749	7.9266	6.9973	PHILIPPINES	64	5.3309	4.1370	6.4766	5.3792
AZERBAIJAN	115	3.9463	3.8420	4.6153	3.3818	INDIA	54	5.5637	4.4939	6.3310	5.8662	POLAND	41	6.2533	6.0433	6.6025	6.1142
BAHREIN	42	6.1568	5.2800	7.5265	5.6640	INDONESIA	68	5.1666	4.3394	6.9236	4.2368	PORTUGAL	31	6.8479	6.7809	6.7476	7.0152
BANGLADESH	125	3.1170	3.2262	3.5024	2.6225	IRAN	99	4.5212	3.6076	5.7703	4.1858	QATAR	22	7.3478	7.1045	8.3744	6.5645
BELGIUM	18	7.8388	7.5489	7.5153	8.4522	IRELAND	17	7.8724	8.1919	7.2465	8.1787	ROMANIA	73	5.0418	5.1501	4.2341	5.7413
BENIN	96	4.5826	4.1692	4.4480	5.1308	ISRAEL	27	6.9741	6.3991	6.8884	7.6347	RUSSIA	111	4.0431	3.4641	3.7222	4.9432
BOLIVIA	113	3.9706	2.9663	5.3810	3.5645	ITALY	49	5.9791	5.2311	5.9132	6.7930	RWANDA	33	6.5078	5.9816	7.5056	6.0361
BOSNIA&HERZEGOVINA	116	3.9169	4.0292	4.2621	3.4596	JAMAICA	46	6.0101	5.1662	6.6331	6.2309	SAUDI ARABIA	43	6.1333	5.4711	7.3772	5.5516
BOTSWANA	44	6.1258	6.5447	7.0664	4.7665	JAPAN	8	8.3267	7.9358	8.4578	8.5865	SENEGAL	75	4.9419	4.7420	5.5740	4.5098
BRAZIL	58	5.4338	4.4380	6.1175	5.7459	JORDAN	40	6.2665	5.5082	7.4546	5.8366	SERBIA	110	4.0442	4.4719	4.2012	3.4593
BRUNEI DARUSSALAM	92	4.6317	6.1875	3.2598	4.4477	KAZAKHSTAN	102	4.4318	4.3968	4.9339	3.9646	SIERRA LEONE	98	4.5232	3.6086	4.9655	4.9954
BULGARIA	85	4.8127	4.4139	4.8029	5.2213	KENYA	82	4.8558	3.6694	6.3094	4.5887	SINGAPORE	7	8.3585	8.3002	8.7039	8.0713
BURUNDI	122	3.4300	2.0979	4.8325	3.3595	KOREA, REP	34	6.4951	5.7566	6.7813	6.9474	SLOVAKIA	37	6.3956	5.3224	6.9959	6.8684
CAMEROON	104	4.2936	3.1444	5.3858	4.3505	KUWAIT	61	5.3799	5.1929	6.5510	4.3958	SLOVENIA	47	5.9936	6.2072	5.8452	5.9283
CANADA	11	8.1789	8.3684	7.9058	8.2624	LATVIA	63	5.3411	5.8363	4.9326	5.2544	SOUTH AFRICA	26	7.0003	5.7123	7.8379	7.4508
CHAD	117	3.8915	2.5762	4.8143	4.2839	LEBANON	103	4.3315	2.9617	6.6668	3.3659	SPAIN	35	6.4219	5.8661	6.6453	6.7542
CHILE	28	6.9262	6.8691	7.5037	6.4058	LIBERIA	81	4.8932	3.8475	6.0281	4.8040	SRI. LANKA	59	5.3896	5.0325	6.3383	4.7981
CHINA	52	5.7122	4.5244	6.9986	5.6136	LITHUANIA	50	5.9178	6.2008	5.4793	6.0732	SWEDEN	3	8.6084	8.6753	8.6600	8.4900
COLOMBIA	62	5.3541	3.7689	6.5752	5.7181	LUXEMBURG	6	8.4593	8.6200	8.3131	8.4449	SWITZERLAND	4	8.5614	8.7717	8.5083	8.4043
CONGO, DEM. REP.	119	3.8184	1.8236	5.4352	4.1965	MACEDONIA, FYR	91	4.6545	4.4009	5.3328	4.2299	TAIWAN (China)	24	7.2678	6.5862	8.2826	6.9345
COSTA RICA	45	6.0599	6.3980	6.3987	5.3829	MADAGASCAR	109	4.0638	3.5014	4.4949	4.1950	TANZANIA, UNITED REP. OF	72	5.0510	4.1977	5.6975	5.2578
CÔTE D'IVOIRE	95	4.5873	3.9174	5.7245	4.1199	MALAWI	90	4.6704	4.5108	5.1346	4.3659	THAILAND	66	5.2150	4.3232	6.8654	4.4565
CROATIA	86	4.7541	5.1497	4.3486	4.7638	MALAYSIA	32	6.6102	5.8082	7.5945	6.4278	TRINIDAD & TOBAGO	55	5.5031	4.9031	5.6822	5.9241
CYPRUS	57	5.4468	6.5680	4.0168	5.7555	MALI	84	4.8142	3.3901	5.8757	5.1767	TUNISIA	70	5.0806	4.4569	6.1260	4.6588
CZECH REP.	30	6.8605	6.4351	6.8603	7.2859	MALTA	29	6.8809	6.8439	7.3285	6.4704	TURKEY	78	4.9246	3.9328	5.3787	5.4623
DENMARK	12	8.1584	8.5074	7.6839	8.2838	MAURITANIA	108	4.0911	3.3678	4.3391	4.5665	UGANDA	69	5.1023	3.7307	6.3744	5.2020
DOMINICAN REP.	83	4.8228	3.8766	6.2301	4.3616	MAURITIUS	38	6.3155	6.5347	7.2278	5.1839	UKRAINE	123	3.4243	2.4762	3.3779	4.4189
ECUADOR	93	4.6274	3.2746	5.5428	5.0649	MEXICO	67	5.1942	3.6267	6.1022	5.8537	UNITED ARAB EMIRATES	21	7.4826	7.0301	8.2030	7.2146
EGYPT	101	4.4328	4.0750	4.7528	4.4706	MOLDOVA	124	3.1781	3.3620	3.5102	2.6622	UNITED KINGDOM	13	8.1292	8.0987	7.8320	8.4570
EL SALVADOR	74	4.9449	4.1792	6.2072	4.4484	MONTENEGRO	105	4.1915	4.8795	4.3999	3.2952	UNITED STATES	14	8.0741	7.3927	8.1141	8.7155
ESTONIA	25	7.1992	7.3396	7.6472	6.6108	MOROCCO	56	5.5004	4.5829	6.5473	5.3709	URUGUAY	36	6.4115	7.1761	6.7077	5.3507
ETHIOPIA	87	4.7180	3.8259	5.9020	4.4260	MOZAMBIQUE	94	4.6253	3.4871	5.5706	4.8181	VENEZUELA, BOLIVARIAN REP	126	3.0566	1.6795	4.6892	2.8012
FINLAND	2	8.6257	8.8596	8.3461	8.6714	NEPAL	76	4.9409	4.0112	6.6540	4.1576	VIETNAM	77	4.9295	4.4765	5.7947	4.5174
FRANCE	23	7.3364	7.0381	6.8786	8.0924	NETHERLANDS	9	8.2960	8.3913	7.9496	8.5471	YEMEN, REP.	127	2.7281	1.6929	4.7837	1.7075
GABON	89	4.6942	4.0556	4.9807	5.0463	NEW ZEALAND	1	8.6335	9.0311	8.8255	8.0438	ZAMBIA	79	4.9168	4.7346	6.0969	3.9187
GEORGIA	88	4.7074	5.3176	5.8393	2.9652	NICARAGUA	112	3.9899	3.2630	4.9574	3.7494	ZIMBABWE	120	3.7597	2.9813	4.7944	3.5035
GERMANY	16	7.9593	7.8379	7.6642	8.3759	NIGERIA	114	3.9505	2.8759	5.0707	3.9048						
GHANA	53	5.6456	5.2644	5.8779	5.7944	NORWAY	5	8.5326	8.8052	8.5115	8.2811	ALL Countries		5.6336	5.1715	6.2265	5.5027

figure 3. IPRI 2017: Scores and Rankings



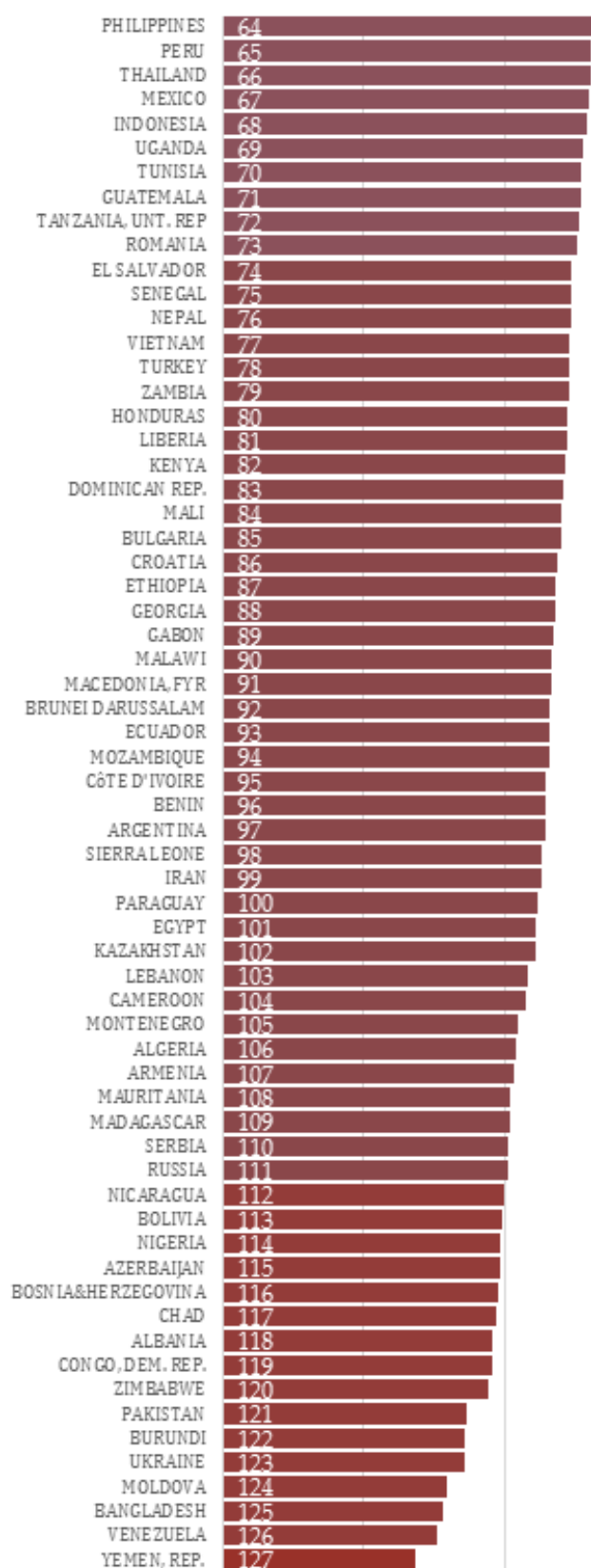


Table 5. IPRI 2017. Rankings by Quintiles

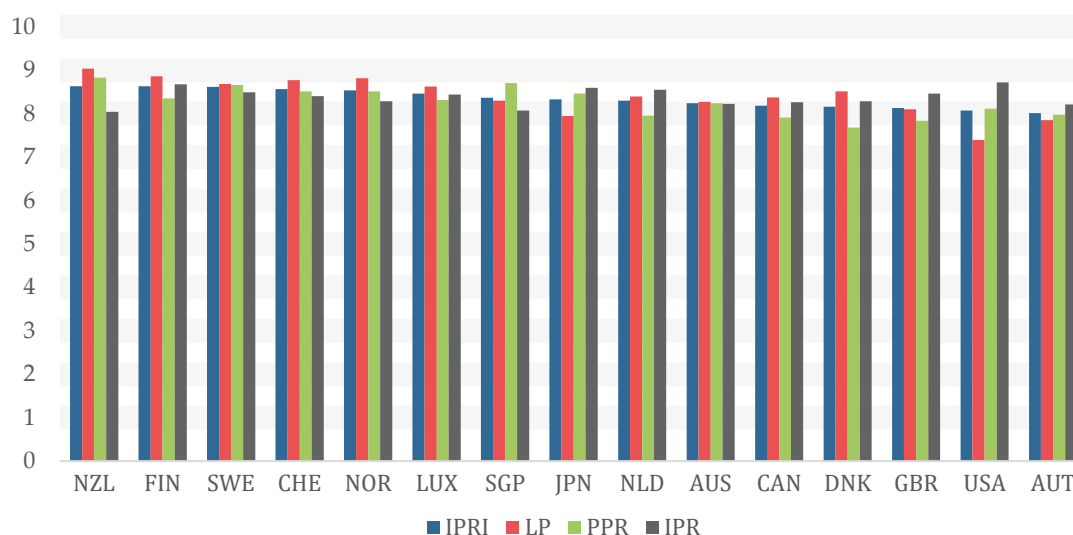
Top 20 Percent	2nd Quintile	3rd Quintile	4th Quintile	Bottom 20 Percent
NEW ZEALAND	BELGIUM	MAURITIUS	LATVIA	BRUNEI DARUSSALAM
FINLAND	HONG KONG	OMAN	PHILIPPINES	ECUADOR
SWEDEN	ICELAND	JORDAN	PERU	MOZAMBIQUE
SWITZERLAND	UNITED ARAB EMIRATES	POLAND	THAILAND	CÔTE D'IVOIRE
NORWAY	QATAR	BAHREIN	MEXICO	BENIN
LUXEMBURG	FRANCE	SAUDI ARABIA	INDONESIA	ARGENTINA
SINGAPORE	TAIWAN (China)	BOTSWANA	UGANDA	SIERRA LEONE
JAPAN	ESTONIA	COSTA RICA	TUNISIA	IRAN
NETHERLANDS	SOUTH AFRICA	JAMAICA	GUATEMALA	PARAGUAY
AUSTRALIA	ISRAEL	SLOVENIA	TANZANIA, UNITED REP. OF	EGYPT
CANADA	CHILE	HUNGARY	ROMANIA	KAZAKHSTAN
DENMARK	MALTA	ITALY	EL SALVADOR	LEBANON
UNITED KINGDOM	CZECH REPUBLIC	LITHUANIA	SENEGAL	CAMEROON
UNITED STATES (USA)	PORTUGAL	PANAMA	NEPAL	MONTENEGRO
AUSTRIA	MALAYSIA	CHINA	VIETNAM	ALGERIA
GERMANY	RWANDA	GHANA	TURKEY	ARMENIA
IRELAND	KOREA, REP	INDIA	ZAMBIA	MAURITANIA
	SPAIN	TRINIDAD AND TOBAGO	HONDURAS	MADAGASCAR
	URUGUAY	MOROCCO	LIBERIA	SERBIA
	SLOVAKIA	CYPRUS	KENYA	RUSSIA
		BRAZIL	DOMINICAN REPUBLIC	NICARAGUA
		SRI. LANKA	MALI	BOLIVIA
		GREECE	BULGARIA	NIGERIA
		KUWAIT	CROATIA	AZERBAIJAN
		COLOMBIA	ETHIOPIA	BOSNIA AND HERZEGOVINA
			GEORGIA	CHAD
			GABON	ALBANIA
			MALAWI	CONGO, DEM. REP.
			MACEDONIA, FYR	ZIMBABWE
				PAKISTAN
				BURUNDI
				UKRAINE
				MOLDOVA
				BANGLADESH
				VENEZUELA, BOLIVARIAN REP. OF
				YEMEN, REP.

Strongest

Weakest

Figure 4 shows the top 15 countries in this IPRI edition. New Zealand leads the IPRI overall position (8.6335) and the LP (9.0311) and the PPR (8.8255) components. Finland ranks second at the IPRI (8.6257) and its IPR component (8.6714) is second overall as well. It is followed by Sweden (8.6084), Switzerland (8.5614) and Norway (8.5326). The Scandinavian countries keep reporting top IPRI rankings (Finland #2, Sweden #3, Norway #5, and Denmark #12). At the end of this top list we find Austria (8.0122), the USA (8.0741) and the United Kingdom (8.1292). The USA leads the IPR component (8.7155), followed by Finland and Japan (8.3267).

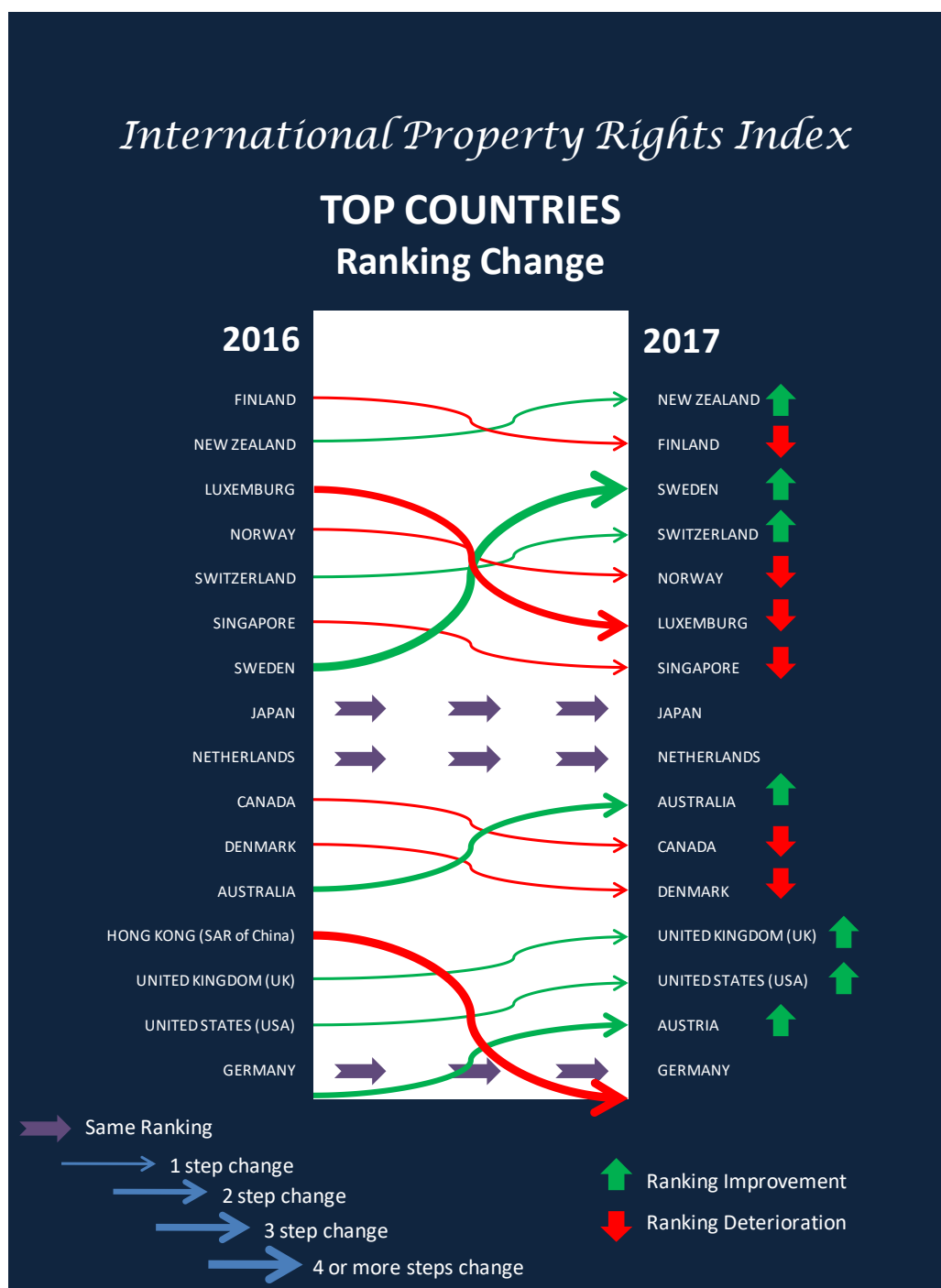
FIGURE 4. IPRI 2017. Top 15 Countries



Most of the top countries are the strongest in the IPRI the LP or the IPR components, this is not the case for Singapore.

Countries in the top quintile vary little from the previous IPRI edition, the group is composed of mostly the same countries and their scores differ only slightly from previous years (see Figure 5).

FIGURE 5. IPRI 2017 vs. IPRI 2016. Top Countries Ranking Change



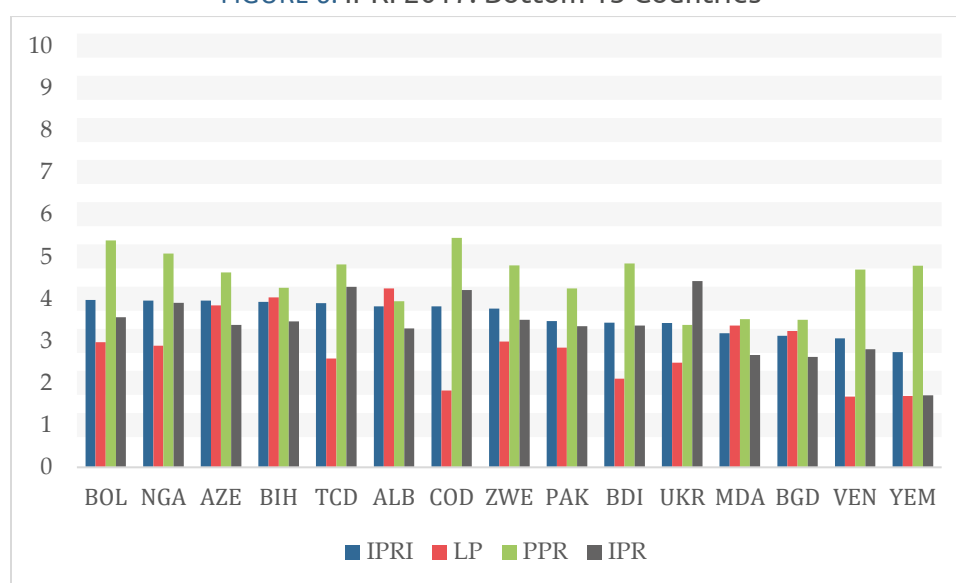
The bottom 15 countries are shown in Figure 6. The Republic of Yemen is #127 in the IPRI ranking (2.7281) followed by the Bolivarian Republic of Venezuela (3.0566), Bangladesh (3.1170), Moldova (3.1781), Ukraine (3.4243) and Burundi (3.43).

Considering the IPRI components we find the following bottom countries:

- LP: the Bolivarian Rep. of Venezuela (1.6795), Rep. of Yemen (1.6929), the Dem. Rep. of Congo (1.8236) and Burundi (2.0979).
- PPR: Brunei (3.2598), Ukraine (3.3779), Bangladesh (3.5024), and Moldova (3.5102).
- IPR: Rep. of Yemen (1.7075), Bangladesh (2.6225), Moldova (2.6622) and the Bolivarian Rep. of Venezuela (2.8012).

Most of the bottom countries show the PPR (not the case for Albania and Ukraine) as the stronger IPRI component, while the weakest is the LP, even though it is not the case for Azerbaijan, Bosnia & Herzegovina, Albania, Moldova and Bangladesh. This situation is the opposite for the top countries and this seems to be a hint to evaluate the ability of LP to pull the rest of the components.

FIGURE 6. IPRI 2017. Bottom 15 Countries



A comparison between the IPRI scores in 2016 and 2017 reveal an improvement, not only in the averages of the IPRI scores and of its components, but also in the maximum level showed by the sample of countries. In both years the minimum score was 2.73, in 2016 for the Bolivarian Rep. of Venezuela and in 2017 for Rep. of Yemen. The 2017 IPRI highest score is 8.6335 (New Zealand) while last year was 8.3768 (Finland). This allows for an improvement of the average IPRI score.

This year, five countries show the highest improvement in their IPRI score: Spain (0.5723), Israel (0.5636), Sweden (0.5099), Ethiopia (0.5069) and Lebanon (0.5005); while the ones with highest decreases in their 2017 IPRI scores were: Romania (-0.4077), Ukraine (-0.5086), Russia (-0.5363), Moldova (-0.5450) and Cyprus (-0.6743).

Looking at these comparisons of the IPRI components we found:

- LP: the average improvement in 2017-2016 was 0.0413 points. The highest LP improvements came from Nigeria (0.3913), Mauritania (0.3442) and the United Republic of Tanzania (0.3106).

-
- Countries with the largest decreases were Macedonia (-0.4480), Burundi (-0.4032) and Bolivia (-0.3960). Changes in LP component score between 2017 and 2016 are shown in Figure 8.
 - PPR: the average improvement in 2017-2016 was 0.352 points. Spain (1.1866) and Nepal (1.1545) showed the highest improvements, while Cyprus (-1.8972) and Russia (-1.8431) showed the deepest declines. Changes in PPR component scores 2017-2016 are shown in Figure 9.
 - IPR: this year the average IPRI score was 5.50267, showing an improvement of 0.17 from the previous year. The most significant increases in the IPR component were reported by Mauritania (0.5907) and Azerbaijan (0.5334) while the largest decreases were incurred by Bolivia (-0.2802) and Liberia (-0.1530). Changes in IPR component scores between 2017 and 2016 can be seen in Figure 10.

FIGURE 7. IPRI Score 2017-2016 and Variation

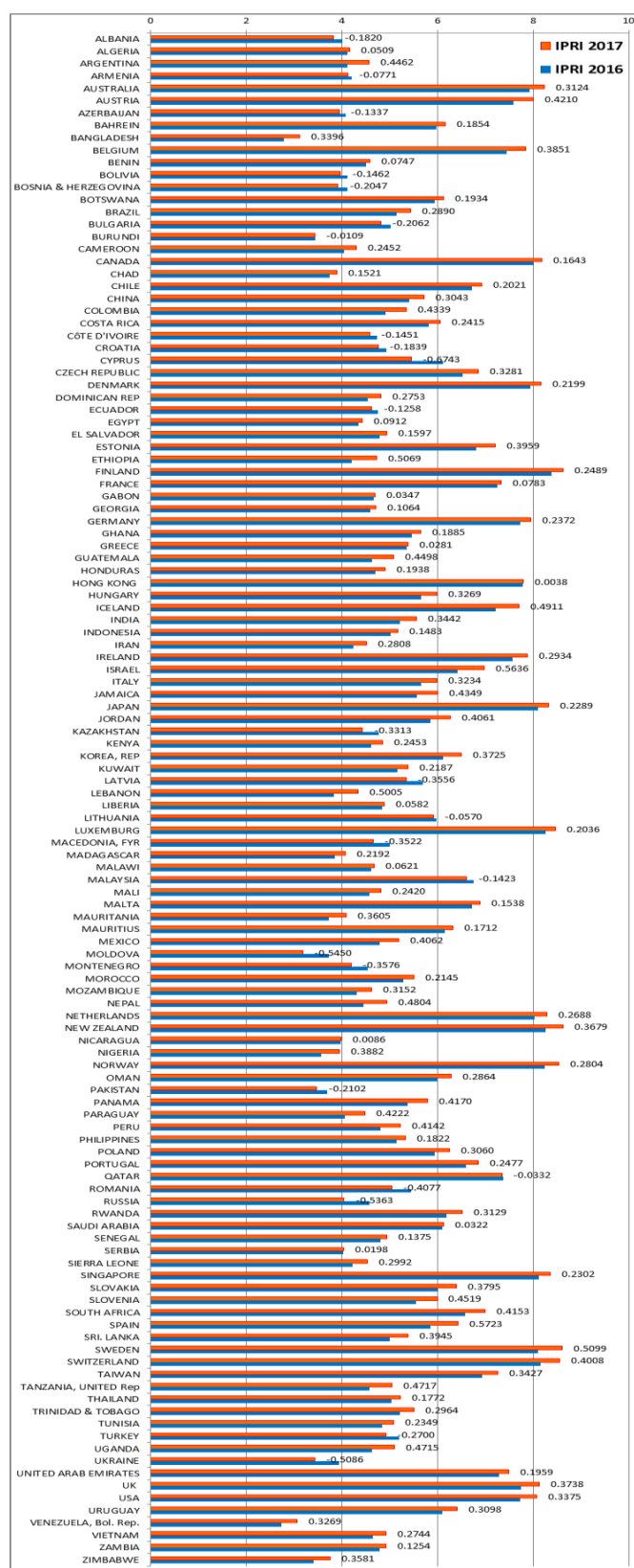


FIGURE 8. LP Score 2016-2017 and Variation

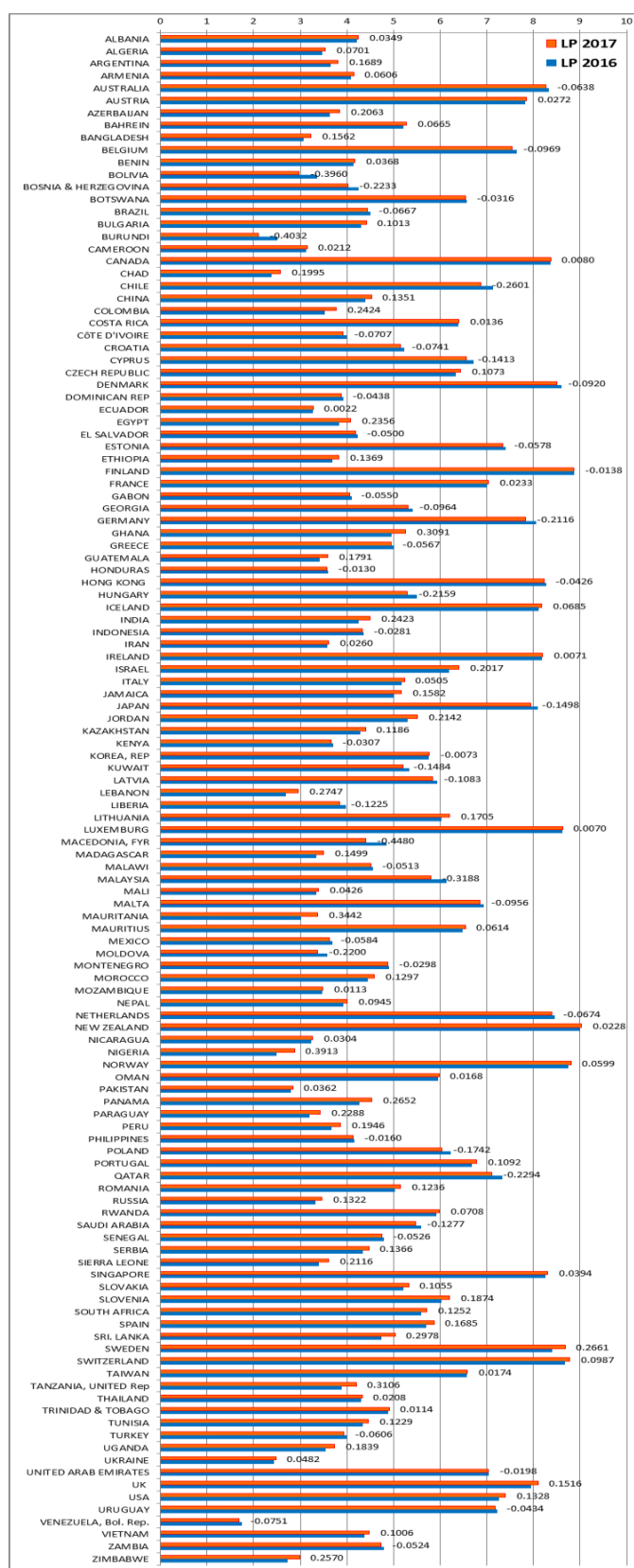


FIGURE 9. PPR Score 2017-2016 and Variation

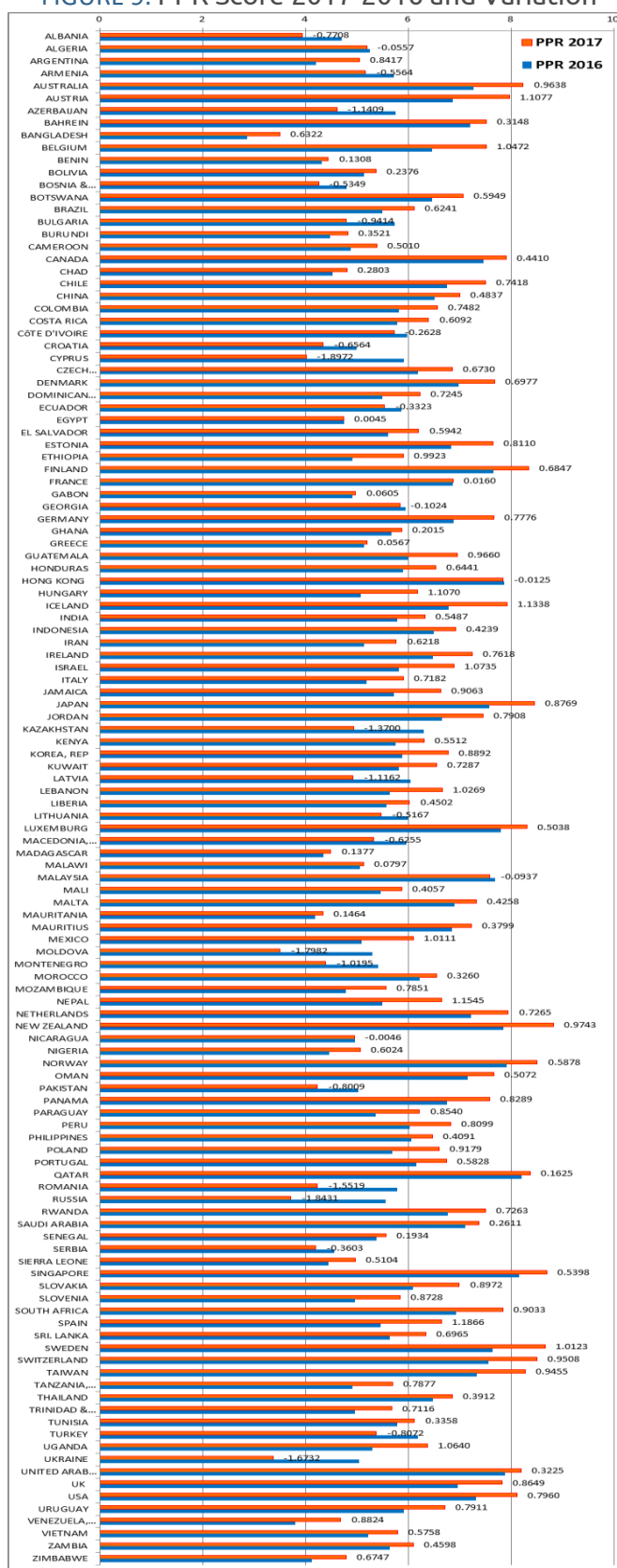
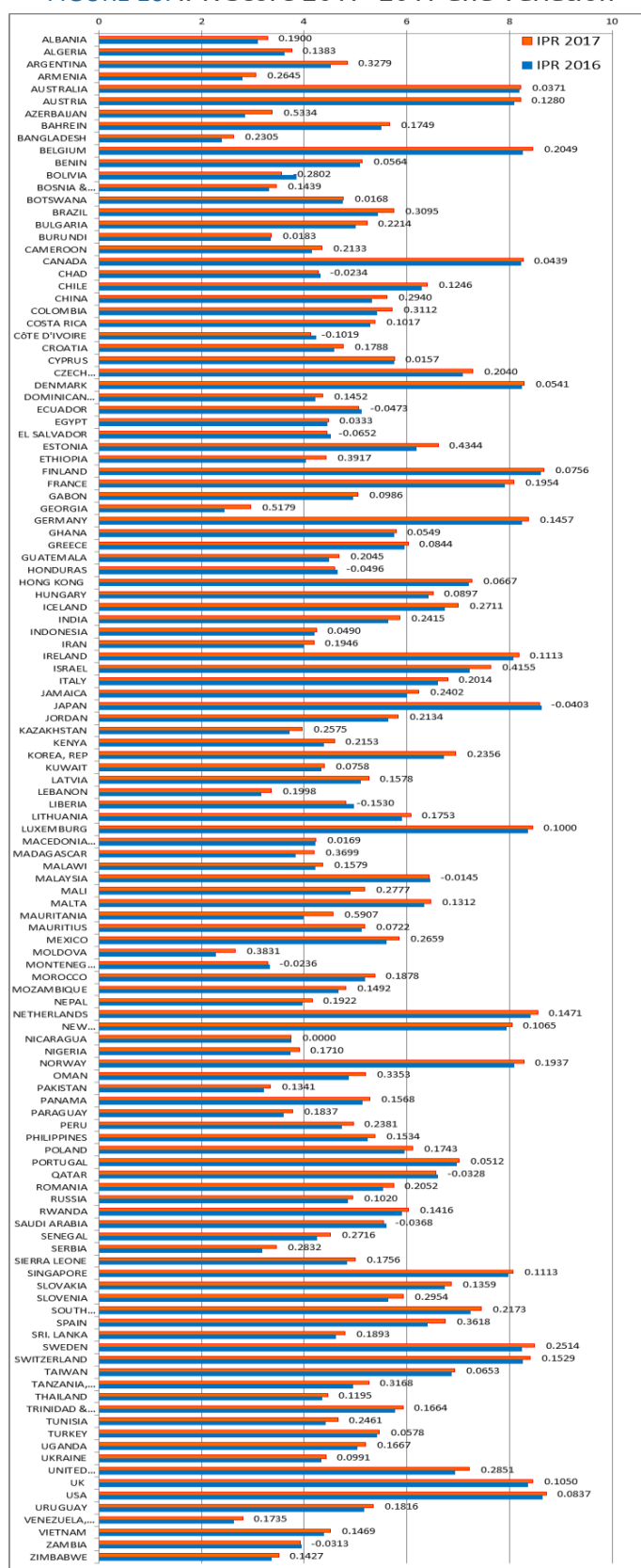


FIGURE 10. IPR Score 2017- 2017 and Variation



IV.1 IPRI 2017 Group Results

After individual country scores were calculated, countries were then sorted into respective groups according to geographical regions, income level, degree of development, membership of trade and regional integration agreements to make further macro comparisons possible. For each group, the IPRI score and of its components were calculated. Past year IPRI classifications were also kept for comparison purposes (see Table 6 and Figures 11-15).

All regions except for CEECA, which declined by 0.124 points, improved their scores. North America and Western Europe keep the top positions, with scores of 8.126 and 7.664 respectively, while Africa (4.810) and CEECA (4.937) countries are at the bottom. Under World Bank region classifications (see Figure 12) Oceania remains the leader with an IPRI score of 8.439, followed by the European Union (6.815) and North America (7.149). Latin America and the Caribbean increased its IPRI score the most from 4.747 to 5.234, or 10.25%.

This year, according to the income criteria of the World Bank there were only four group- each remained the same or improved modestly. The Upper-Middle-Income group recorded a reduction of a 6 thousandth basis point. The strongest improvements in the group were those of the High Income (of 0.364, or 5.44%) and of the Low Income (of 0.333, equivalent to a 7.79%) groups. The Low-Income group (4.608) have higher scores than the Lower-Middle-Income group (4.487). This is the first year IPRI scores do not follow the income classification directly.

IPRI scores under the Regional and Development classification, according International Monetary Fund, show that the top IPRI-2017 scores are held by the Advanced Economies (7.419) followed by the Middle East, North Africa, Pakistan and Afghanistan group (5.210), Emerging and Developing Asia (5.146) which had the highest IPRI score improvement of 7.72%, and Latin American and Caribbean countries (5.117) which experienced a strong improvement of 7.61%. At the bottom, we find the CIS countries scoring 3.98 with an important step back of 0.289 points, followed by Emerging and Developing Europe 4.764 and Sub-Saharan Africa (4.838) which showed a slight improvement of 3.62%.

Considering economic integration agreements, we included this year the OECD countries, as they are not anymore part of the Income criteria used by World Bank. The top five groups are EFTA (8.265), OECD (7.278), NAFTA (7.149), TPP (6.944) and EU (6.815). On the other extreme we found: CIS (3.858), CEMA (4.293), CEECA (4.439) and SAARC (4.497). The group with the highest level of improvement was CARICOM at 28.6% (improving from 4.476 in 2016 to 5.757 in 2017), followed by CEECA (11.7%), IGAD (9.1%) and MERCOSUR (8.1%). The only group that showed an important reduction was the CIS (-8.4%).

It should be noted that in spite of the political decision by the UK to exit the EU, we still include it in this economic union as data used is prior to that decision.

We also want to highlight that some groups are in different classifications and they report different score values. That is the case of Commonwealth of Independent States and Latin America and the Caribbean. This is because in some of the classifications they include or exclude particular countries.

Table 6. IPRI 2017. Groups Score

IPRI Regions	IPRI	LP	PPR	IPR	Integration Groups	IPRI	LP	PPR	IPR
A	4.810	4.011	5.680	4.739	OECD	7.278	7.093	7.279	7.462
AO	6.063	5.659	6.743	5.787	EU	6.815	6.759	6.637	7.050
CEECA	4.937	4.916	5.065	4.829	SADC	5.035	4.403	5.936	4.766
LAC	5.117	4.219	6.196	4.937	ECOWAS	4.742	3.977	5.446	4.804
MENA	5.518	4.858	6.659	5.038	ASEAN	5.749	5.367	6.517	5.362
NA	8.126	7.881	8.010	8.489	PARLACEN	4.922	3.836	6.412	4.519
WE	7.664	7.634	7.518	7.839	GCC	6.463	6.009	7.617	5.764
Past IPRI Groupings	IPRI	LP	PPR	IPR	AP	5.758	4.842	6.832	5.601
EU	6.815	6.759	6.637	7.050	MERCOSUR	4.790	4.108	5.758	4.503
Rest Europe	4.988	5.034	5.292	4.637	SAARC	4.497	3.921	5.412	4.159
Africa	4.808	4.030	5.677	4.716	CEMAC	4.293	3.259	5.060	4.560
North Am.	7.149	6.463	7.374	7.611	MCCA	4.995	4.202	6.212	4.570
Ctrl Am & Caribe	5.234	4.387	6.354	4.961	CIS	3.858	3.614	4.222	3.739
South Am	5.004	4.128	6.063	4.822	ARAB M Un	4.708	3.986	5.552	4.587
Asia	5.676	5.156	6.596	5.278	CARICOM	5.757	5.035	6.158	6.078
Oceania	8.439	8.651	8.532	8.132	CAN	4.792	3.467	6.083	4.827
World Bank Income Group	IPRI	LP	PPR	IPR	EFTA	8.265	8.584	8.315	7.894
High income	7.068	6.998	7.156	7.051	IGAD	4.892	3.742	6.195	4.739
Upper middle income	4.975	4.386	5.809	4.729	NAFTA	7.149	6.463	7.374	7.611
Lower middle income	4.487	3.765	5.489	4.207	CEEAC	4.439	3.280	5.492	4.545
Low income	4.608	3.675	5.535	4.613	TPP	6.944	6.677	7.278	6.876
IMF Dev. And Reg. Group	IPRI	LP	PPR	IPR	OPEP	5.135	4.383	6.175	4.848
Adv. Econ.	7.419	7.367	7.352	7.539					
CIS	3.980	3.858	4.453	3.628					
Emrg and Dev Asia	5.146	4.596	6.067	4.775					
Emrg and Dev Europe	4.764	4.727	4.880	4.686					
Lat. Am & Caribe	5.117	4.219	6.196	4.937					
MENA & Pakistan	5.210	4.542	6.348	4.740					
Sub-Saharan Africa	4.838	4.036	5.732	4.746					

FIGURE 11. IPRI 2017 and Components. Group Score

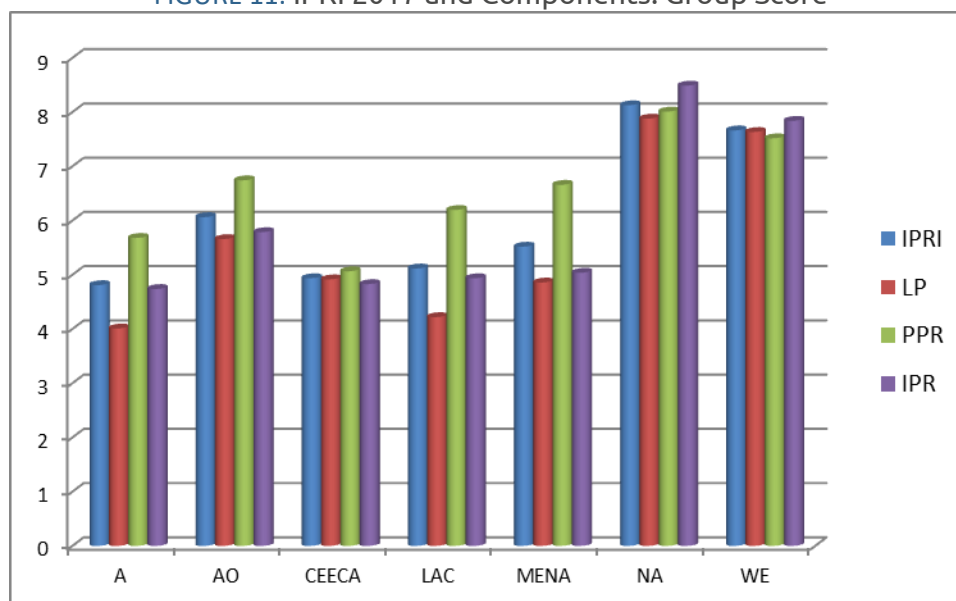


FIGURE 12. IPRI 2017 and Components. Regional Groups Score

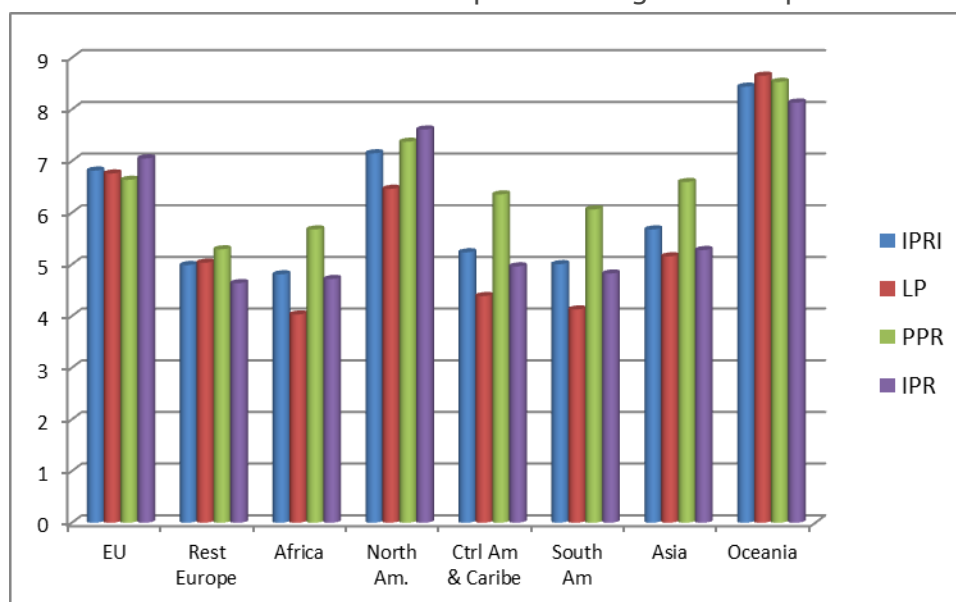


FIGURE 13. IPRI 2017 and Components. Development Groups Score

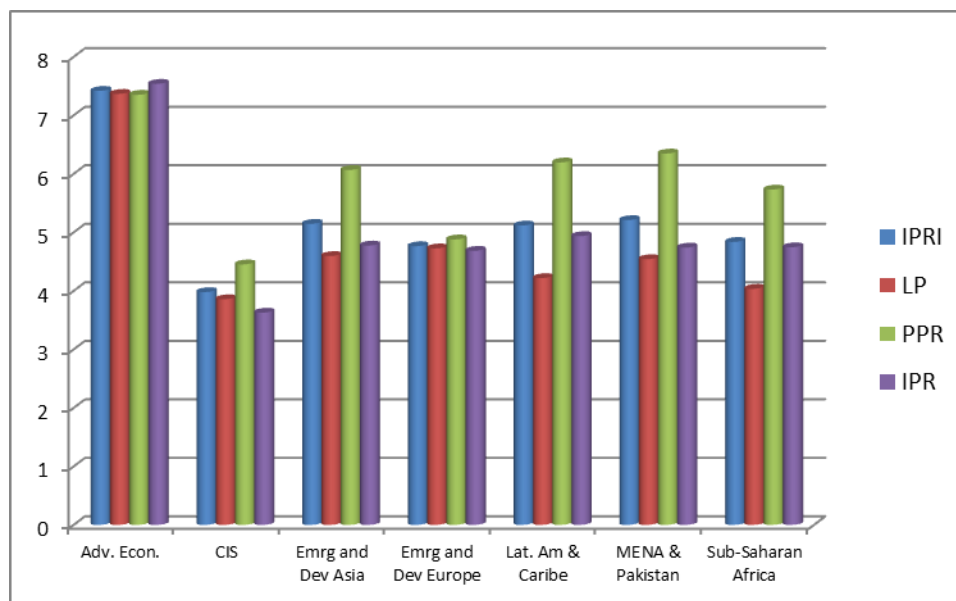


FIGURE 14. IPRI 2017 and Components. Income Groups Score

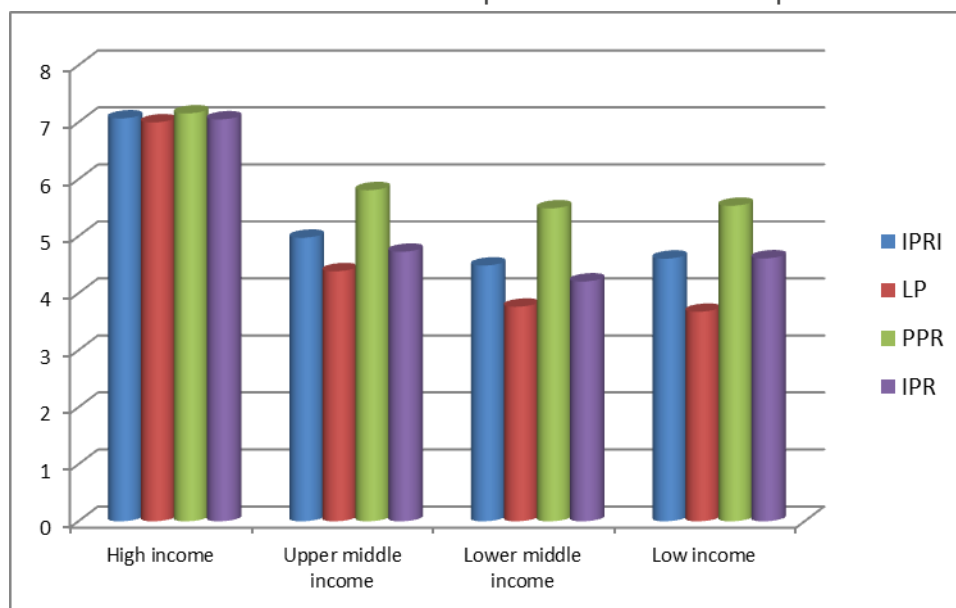
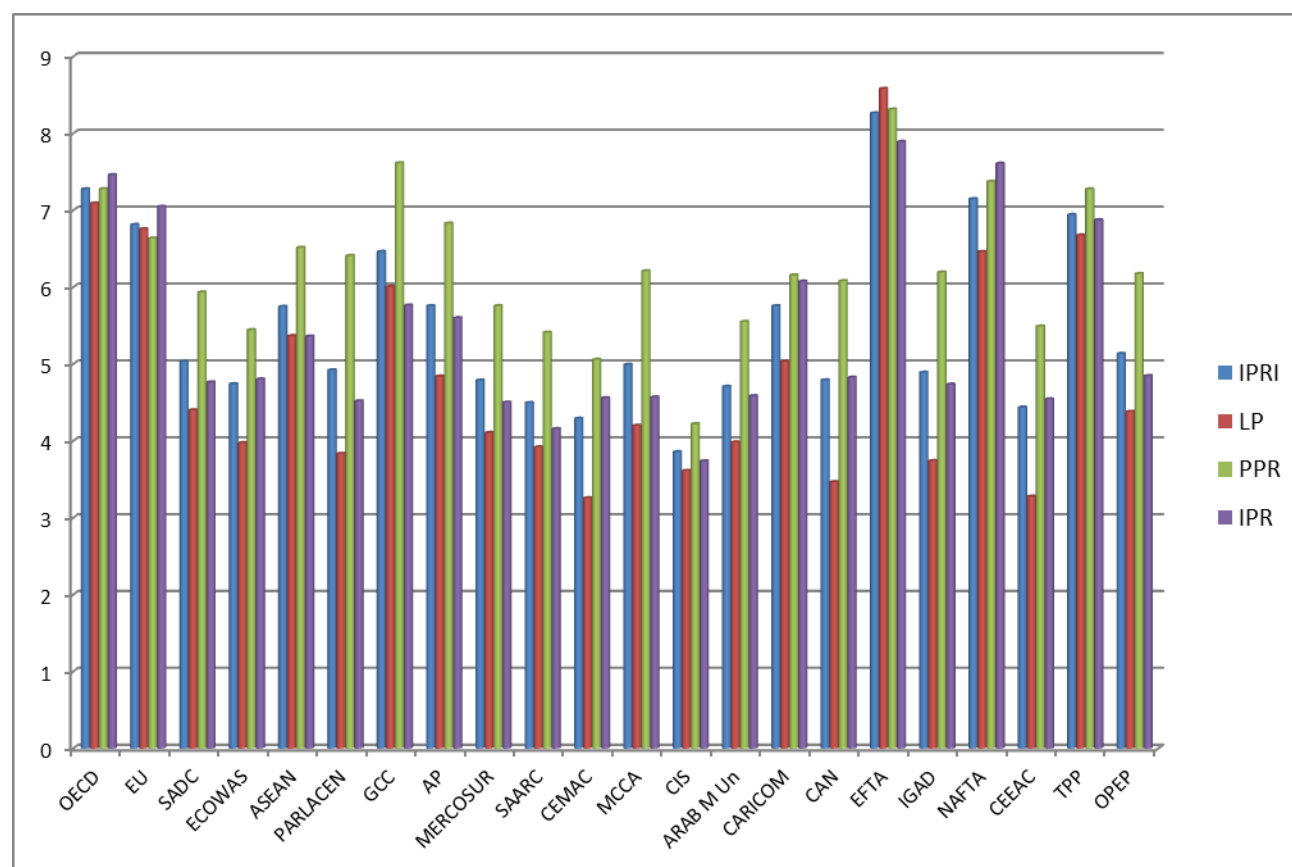


FIGURE 15. IPRI 2017 and Components. Economic & Regional Integration Agreement Groups Score



V. IPRI-Population

Since 2015 the IPRI has computed a population incidence into the index. In this regard, we note that although the IPRI-2017 average score is 5.6336, when it is weighted by population, it is 5.522. This is a slight decrease from the 2016 population weighted IPRI score of 5.28, but still better than the 2015 score of 5.176. Clearly, property rights for the vast majority of the world's people must continue to improve.

Taking into account a demographic perspective is very important for an index such as the IPRI, which considers property rights a human right, irrespective of political boundaries. With this approach, the IPRI becomes an even more powerful tool for policy makers

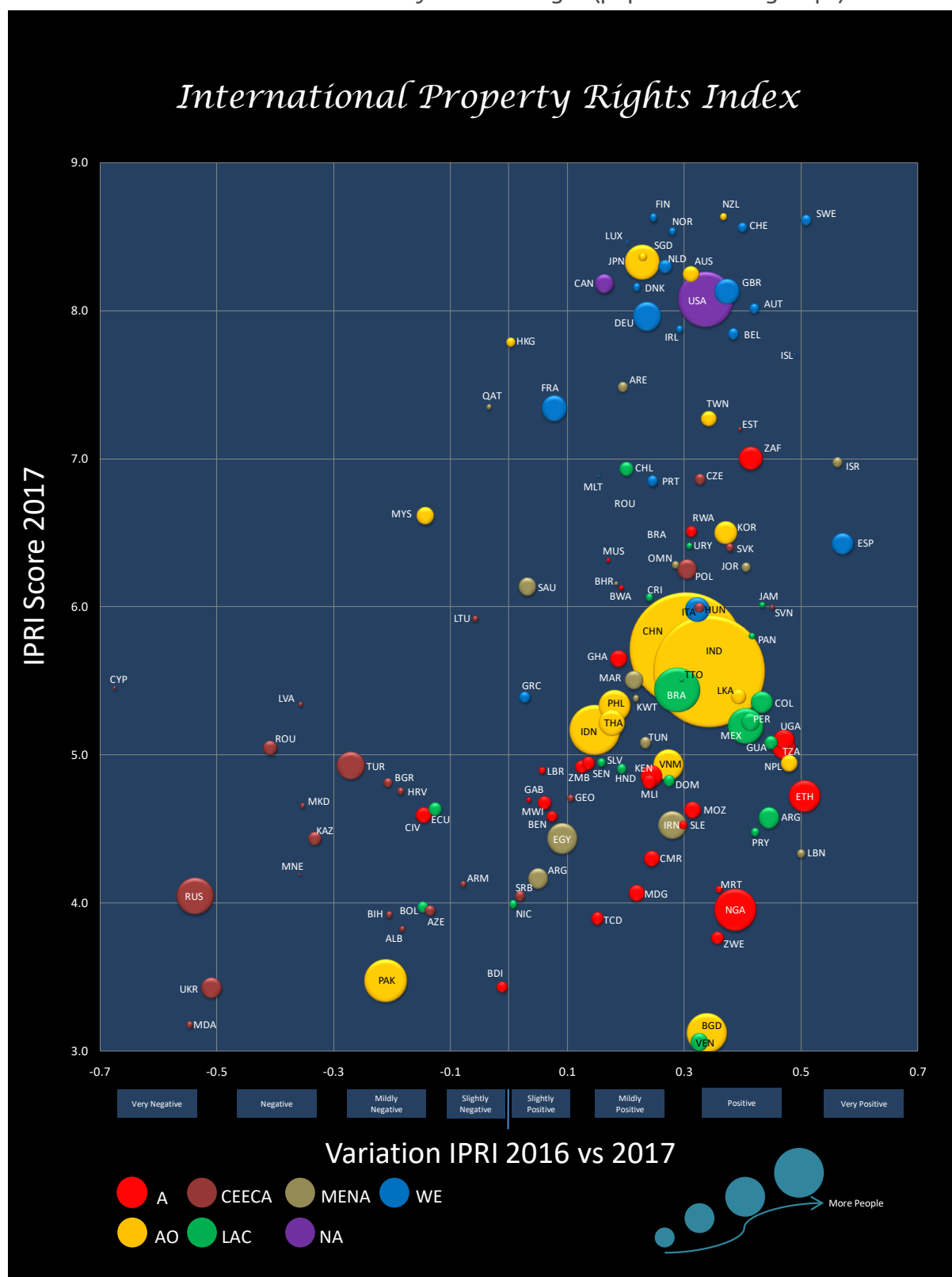
This year's sample of 127 countries has a population of 6.87 billion people, with 68% of the population residing in 66 countries that tolerate weak middle-of-the-road IPRI ratings [4.5-6.4]. The highest level of property right protections [6.5-9.4] are enjoyed by only 15.2% of the population in 34 countries, and 14% of the population live in 27 countries with the lowest levels [2.5-4.4] of property rights. This year the ranges were widened as the maximum score of this year is 8.6335 earned by New Zealand.

Table 7. IPRI 2017 and Population

IPRI 2017	Countries (number)	Population (thousand)	% Population	Incidence (%)	IPRI-Population
2.5 a 3.4	6	279,008	4.06	2.646	2.307
3.5 a 4.4	21	873,551	12.72	11.846	9.062
4.5 a 5.4	44	1,693,397	24.66	30.365	22.571
5.5 a 6.4	22	2,978,506	43.38	18.510	44.605
6.5 a 7.4	13	285,176	4.15	12.615	5.215
7.5 a 8.4	15	723,165	10.53	16.830	15.472
8.5 a 9.4	6	33,888	0.49	7.187	0.768
	127	6,866,690	100	100	100

Figure 16 shows a combination of elements while analysing changes in the IPRI scores: country, population and belonging to particular group. It's positive news to see that most of the countries have improved their scores, particularly since densely populated countries show a mildly positive to positive change in fostering their property rights system.

FIGURE 16. IPRI 2017. Country Score Changes (population and groups)



VI. IPRI and Gender

It is known that property rights within countries can sharply contrast between genders. The IPRI would simply not be complete without measuring this unfortunate dynamic. Gender Equality refers to equal rights, responsibilities and opportunities for women and men. Being a subject of human rights and social justice gender equality is a goal in itself. At the same time, its relevance has been demonstrated in fostering development, particularly in some areas such as health, education, agriculture and unbiased access to credit for reducing poverty. In this way gender equality plays a decisive role for less developed and developing countries.

Although organized by countries, the IPRI measures the property right protections of people, so its gender component grasps possible bias due to this condition. We used the Social Institutions and Gender Index, SIGI (by OECD), to calculate the Gender component for the IPRI, using those items most closely related to property rights and its impact in economic development. The SIGI is composed of five sub-indexes, each representing a separate dimension of discrimination: Discriminatory Family Code, Restricted Physical Integrity, Son Bias, Restricted Resources and Assets and Restricted Civil Liberties.

To account for gender equality, this chapter extends the standard IPRI measure to include a measure of gender equality (GE) concerning property rights. The IPRI formula was modified to incorporate gender equality as following:

$$IPRI-GE = IPRI + 0.2*GE$$

A weight of 0.2 for the gender equality measure is arbitrary. We varied the weight to 0.5 or according to the female and male population in each country, but scores were highly correlated. We decided to keep the weight of 0.2 for comparison purposes with previous data series.

VI.1 Data & Methodology

The GE component is calculated using the following five indicators (Source: OECD Gender, Institutions, and Development Database 2014 (GID-DB) details in Appendix III):

1. **Women's Access to Land:** whether women and men have equal and secure access to land use, control and ownership.
2. **Women's Access to Credit:** measures whether women and men have equal access to financial services.
3. **Women's Access to Property Other than Land:** determines whether women and men have equal and secure access to non-land assets use, control and ownership
4. **Inheritance Practices:** combines two elements:
 - a. Inheritance Practice to Daughters: considers whether daughters and sons have equal inheritance rights.
 - b. Inheritance Practice to Widows: assesses whether widows and widowers have equal inheritance rights.
5. **Women's Social Rights:** covers broader aspects of women's equality and it is a composite of four other items crucial to equal standing in society:

- c. Parental authority
 - i. *In marriage*: determines whether women and men have the same right to be the legal guardian of a child during marriage.
 - ii. *After divorce*: measures whether women and men have the same right to be the legal guardian of and have custody rights over a child after divorce.
- d. Female genital mutilation: measures the occurrence of female genital mutilation.
- e. Access to public space: evaluates whether women face restrictions on their freedom of movement and access to public space.
- f. Son preference in education: express the percentage of people agreeing that university is more important for boys than for girl.

The original data has three levels: 0 (Best), 0.5 (Average) and 1 (Worst). All data series were rescaled to IPRI the scale (0-10). The final GE score is an index based on the average of the five equally weighted variables. Those variables with more than one item were equally weighted as well. A minimum score (0) means complete discrimination against women, while maximum score (10) is given to countries with gender equality. After calculating GE as an independent measure, it is added to the IPRI as an 11th component to make the IPRI-GE ratings using a scale of (0-12). As the GE data source is discrete, equal outcomes are likely to be found. That is minimized in the IPRI-GE thanks to the variability of the IPRI scores.

VI.2. IPRI-GE and GE. Country Results

The IPRI-GE shows results for 123 of the 127 countries included in the 2017 IPRI, data was unavailable for Brunei Darussalam, Malta, Montenegro and Taiwan. On the other hand, Haiti, Myanmar, Swaziland and Latvia were present in 2016, but they are not in 2017, while Democratic Rep. of Congo and Rep. of Yemen were included this year.

As an average, the 123 countries show a GE score of 7.118 which is lower than the prior two years (2016=7.466; 2015=7.39). while the IPRI-GE score is 7.438 showing a sustained improvement (2016=6.933; 2015= 6.76). This means that gender equality is deteriorating as an average, while the property rights protection improves. Looking in detail to the GE component we find that the Inheritance Practices (for widows and daughters) and Women Access to Land Ownership are the two items with lower scores (Figures 17a and 17b).

As in 2016 edition, the same 14 countries received the maximum score of GE=10: Austria, Belgium, Croatia, Czech Rep., Denmark, Dominican Rep. Iceland, Ireland, Latvia, Lithuania, Luxemburg, Panama, Portugal and Slovakia, and 30 other countries were in the range of [9-10]. The bottom scores of GE are held by the Democratic Republic of Congo (2.67), Nigeria (3.12), Zambia (3.25), Egypt (3.37), Yemen Rep. (3.59), Oman (3.67), United Arab Emirates (3.67), Saudi Arabia (3.67), Chad (3.71), Iran (3.73) and Mauritania (3.85).

New Zealand leads the IPRI-GE (10.628), followed by Finland (10.62), Sweden (10.61), Norway (10.53), Luxemburg (10.46), Switzerland (10.45), Japan (10.31), Netherlands (10.29), Australia (10.24), Canada (10.17), Denmark (10.16), USA (10.07) and Austria (10.01). All of them are very close in their score values and over 10. In a score range [10-9] we find Germany, Singapore, Ireland, Belgium, UK, Iceland, France, Hong Kong and Estonia.

On the other extreme of the IPRI-GE, with scores below 5, we find Yemen Rep. (3.45), Bangladesh (3.91), Congo Dem. Rep. (4.35), Pakistan (4.47), Nigeria (4.57), Burundi (4.63), Chad (4.63), Moldova (4.76), Mauritania (4.86) and Algeria (4.998).

Analyzing the IPRI-GE score by country groups we found very interesting results (see Figure18):

- Geographical Regions: at the top, we find North America (10.121) and Western Europe (9.655), while at the bottom are Africa (5.887) and MENA countries (6.463). In the former group the GE component is particularly low, pushing down the IPRI-GE score. just the opposite happens to CEECA, where better GE (9.133) scores pulls up its IPRI-GE (6.795) score.
- Regional and Development criteria (IMF): Advanced Economies (9.367) is leading the group followed by Latin America and the Caribbean (6.785), Emerging and Developing Europe (6.630), Emerging and Developing Asia (6.388), and MENA & Pakistan (6.086). At the bottom, we find CIS (5.664) and Sub-Saharan Africa (5.926). CIS countries show a high GE score (8.422) but the IPRI score (3.980) pulls down the IPRI-GE, similar situation happens with Latin America and the Caribbean (GE=8.336; IPRI=5.117; IPRI-GE=6.785), while the opposite happens with MENA & Pakistan (GE= 4.377) and Emerging and Developing Asia (5.952) where the GE score is low.
- Income classification (World Bank): this year the GE does not follow the same pattern than the IPRI, nor of the IPRI-GE. This is because the Low-Income group shows scores slightly better than the Lower-Middle-Income group in IPRI and IPRI-GE, and GE scores.
- Economic and Regional Integration Agreements: As in the IPRI the five top groups are: EFTA (10.227), OECD (9.207), NAFTA (8.938), TPP (8.822) and EU (8.778). The bottom groups are: CEMAC (5.184), CEEAC (5.355), SAARC (5.557) and CIS (5.602). It should be noted that CIS, MERCOSUR, CAN, MCCA and CARICOM show high GE scores, but their IPRI scores reduce their IPRI-GE values.

FIG. 17a. IPRI-GE 2017. Scores & Rankings

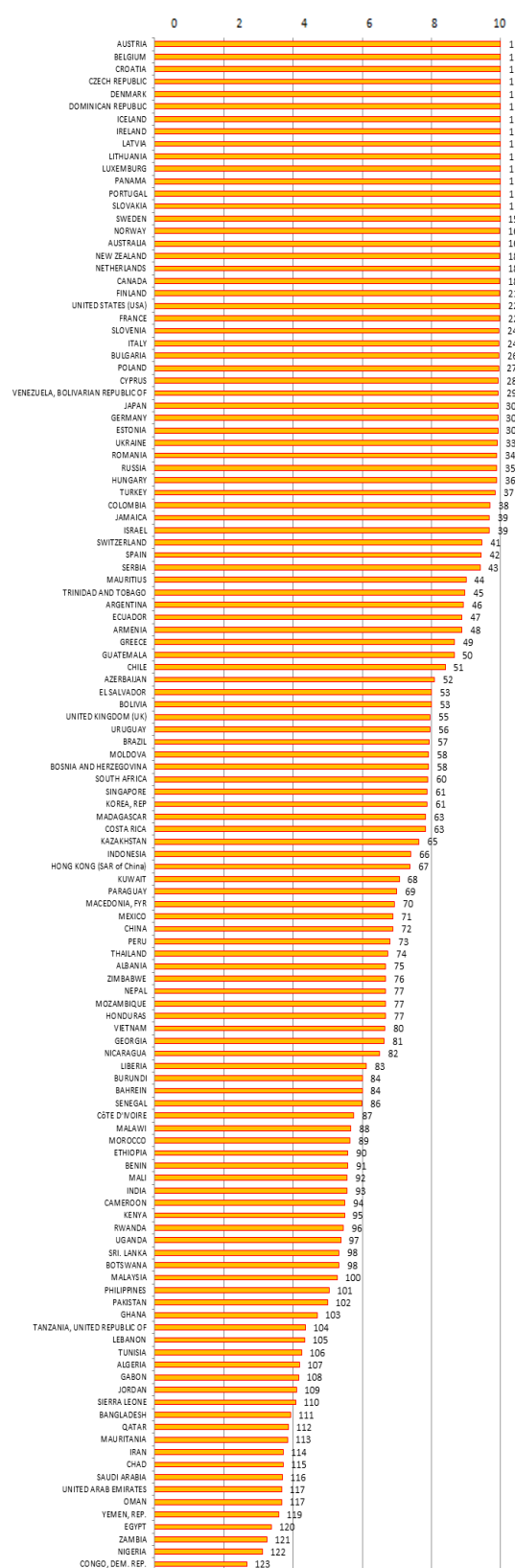


FIG. 17b. GE-2017 Scores & Rankings

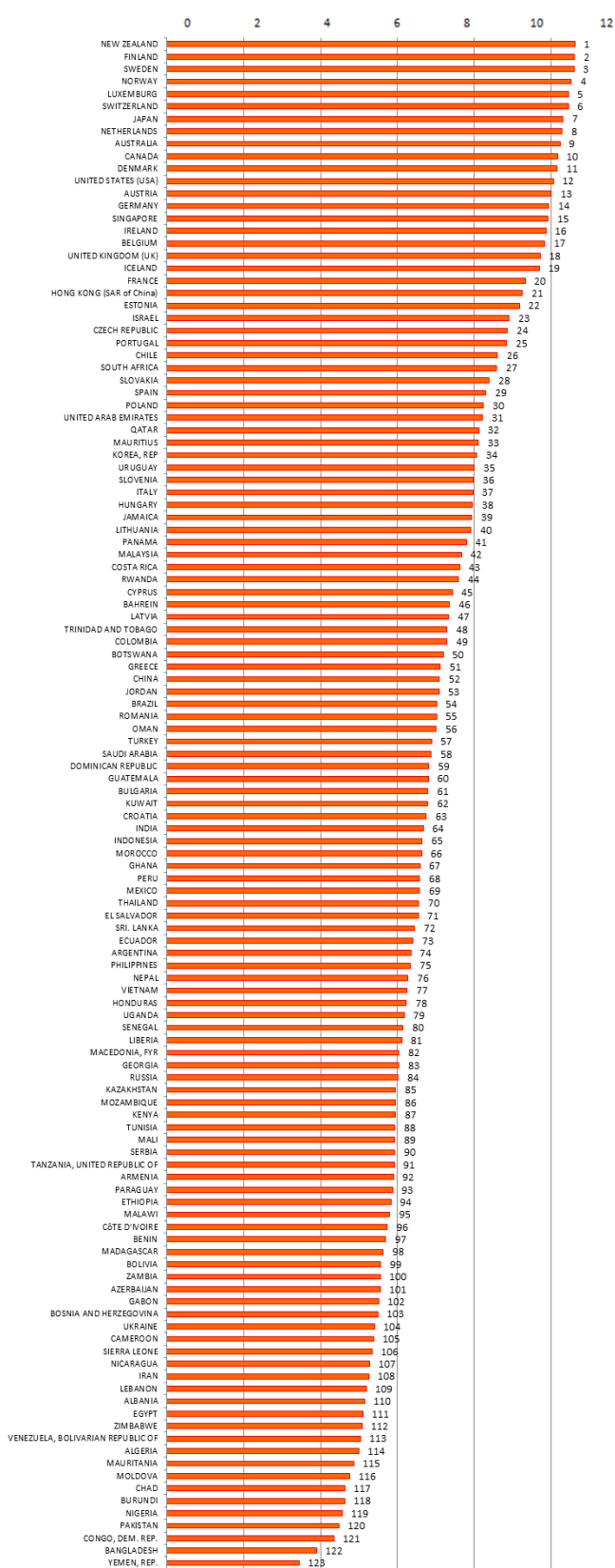


Figure 18. GE and IPRI-GE 2017. Groups of Countries

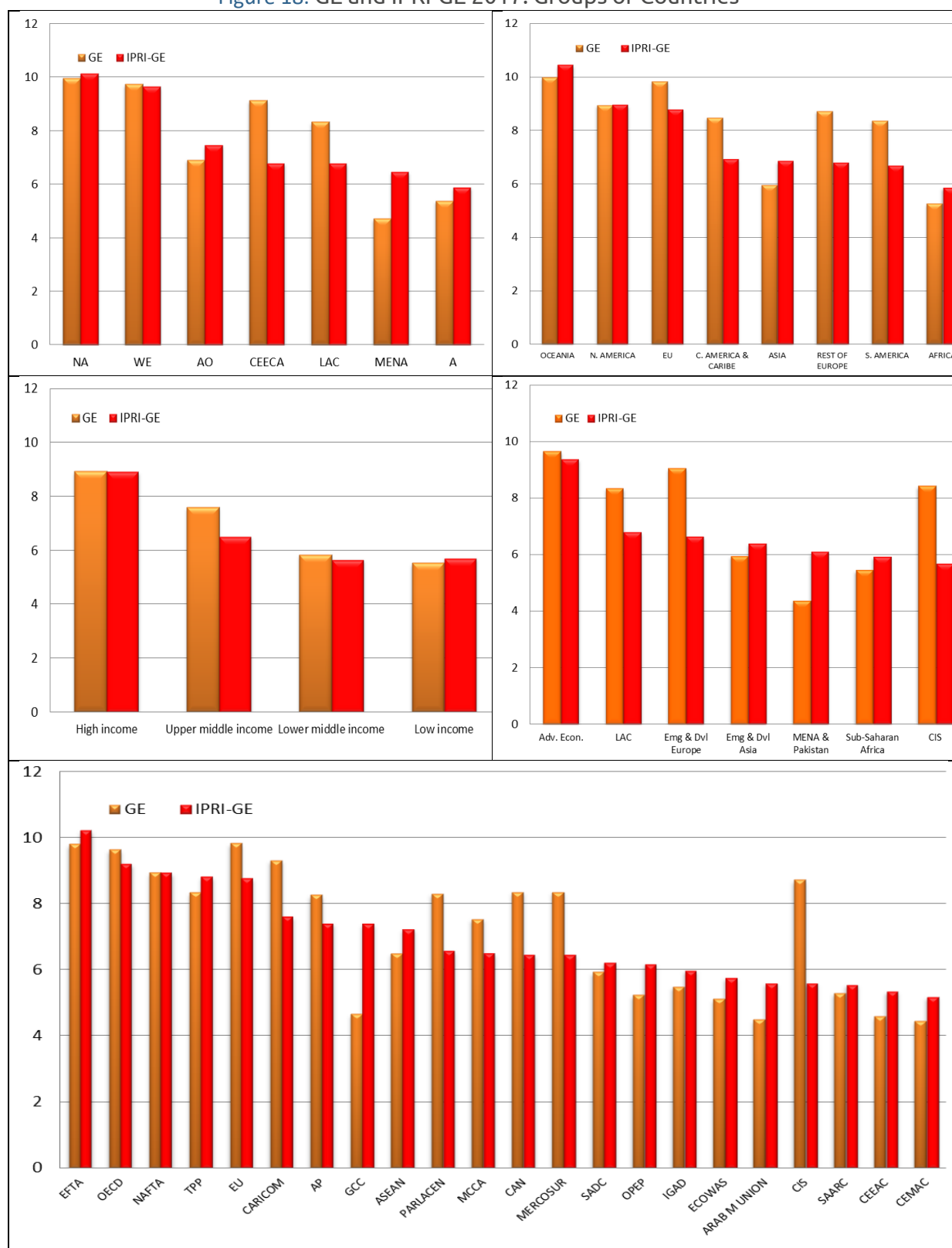


Table 8 shows the IPRI-GE 2017 rankings by quintile for the 123 countries in our sample. As in the IPRI, the number of countries belonging to each quintile increases from the top 20% to the bottom 20% (1st quintile 17 countries, 2nd quintile 20 countries, 3rd quintile 24 countries, 4th quintile 28 countries and 5th quintile 34 countries). Hence, the forth and the fifth quintiles include 50.4% of the countries (62 countries) of the sample.

Table 8. IPRI-GE 2017 Rankings by Quintiles

Top 20 %	2nd Quintile	3rd Quintile	4th Quintile	Bottom 20 %
NEW ZEALAND	UNITED KINGDOM	HUNGARY	KUWAIT	SERBIA
FINLAND	ICELAND	JAMAICA	CROATIA	TANZANIA, UNITED REP. OF
SWEDEN	FRANCE	LITHUANIA	INDIA	ARMENIA
NORWAY	HONG KONG	PANAMA	INDONESIA	PARAGUAY
LUXEMBURG	ESTONIA	MALAYSIA	MOROCCO	ETHIOPIA
SWITZERLAND	ISRAEL	COSTA RICA	GHANA	MALAWI
JAPAN	CZECH REP.	RWANDA	PERU	CÔTE D'IVOIRE
NETHERLANDS	PORTUGAL	CYPRUS	MEXICO	BENIN
AUSTRALIA	CHILE	BAHREIN	THAILAND	MADAGASCAR
CANADA	SOUTH AFRICA	LATVIA	EL SALVADOR	BOLIVIA
DENMARK	SLOVAKIA	TRINIDAD & TOBAGO	SRI LANKA	ZAMBIA
UNITED STATES	SPAIN	COLOMBIA	ECUADOR	AZERBAIJAN
AUSTRIA	POLAND	BOTSWANA	ARGENTINA	GABON
GERMANY	UNITED ARAB EMIRATES	GREECE	PHILIPPINES	BOSNIA & HERZEGOVINA
SINGAPORE	QATAR	CHINA	NEPAL	UKRAINE
IRELAND	MAURITIUS	JORDAN	VIETNAM	CAMEROON
BELGIUM	KOREA, REP	BRAZIL	HONDURAS	SIERRA LEONE
	URUGUAY	ROMANIA	UGANDA	NICARAGUA
	SLOVENIA	OMAN	SENEGAL	IRAN
	ITALY	TURKEY	LIBERIA	LEBANON
		SAUDI ARABIA	MACEDONIA, FYR	ALBANIA
		DOMINICAN REP.	GEORGIA	EGYPT
		GUATEMALA	RUSSIA	ZIMBABWE
		BULGARIA	KAZAKHSTAN	VENEZUELA, BOL. REP. OF
			MOZAMBIQUE	ALGERIA
			KENYA	MAURITANIA
			TUNISIA	MOLDOVA
			MALI	CHAD
				BURUNDI
				NIGERIA
				PAKISTAN
				CONGO, DEM. REP.
				BANGLADESH
				YEMEN, REP.

Strongest

Weakest

VII. IPRI and Development

The notion of development in its evolution has widened by incorporating dimensions and perspectives, weaving them into a multidimensional concept that nowadays includes economic, political, social, cultural, technological and ecological dimensions, for contemporaneous and future generations. Simultaneously, macro aggregates made way for micro details; the preponderance of averages demanded attention to deviations; quantitative indices were complemented with qualitative indicators; and objective evaluations gave up under subjective perceptions. Consequently, we have moved from those vertical plans to achieve 'progress' as a result, to open alternatives for expanding opportunities that allow individuals to achieve their goals in freedom.

This way, ethics is central to the analysis of the complexities of human social development, having received important theoretical contributions this century from Amartya Sen (1999)¹⁵ and Martha Nussbaum (2011).¹⁶ The body of work created by Sen and Nussbaum define development as the increase of human capabilities to achieve 'development as freedom,' providing a normative philosophical foundation for a theory of human rights, an essential requirement for a dignified life with social justice. According to them, 'capability' or 'substantial freedom' is the essential element of development. The central players in their model are human beings, how they assess their quality of life, and how they are able to make proactive efforts to improve their wellbeing. From this perspective, development does not refer to goods or services to which people have access, but rather to their ability to accomplish their goals in life. Therefore, the expansion of freedom is central to this approach (Levy-Carciente, S. *et al.* 2014)¹⁷

With this in mind, and given the extensive literature that informs the important interactions between property rights and development, we analyzed in this edition different dimensions of development with the IPRI and its components, as follows:

- Economic outcomes
- Liberties
- Human Capabilities
- Social Capital
- Research and Innovation
- Ecological performance

VII.1. Economic Outcomes

Economic outcomes, obviously do not capture each factor of development. Many other factors are likely to influence it, however it is a first approach to it. Four economic elements are considered to evaluate the correlations with the IPRI and its components (for source details see Appendix IV):

- **Production:** using the Gross Domestic Product (GDP) in constant USD in *per capita* terms and also adjusted by the Gini coefficient. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the

¹⁵ Sen, Amartya. 1999. *Development as Freedom*. Oxford: Oxford University Press.

¹⁶ Nussbaum, Martha C. 2011. *Creating Capabilities: The Human Development Approach*. Cambridge: Harvard University Press

¹⁷ Levy-Carciente, Sary *et al.* 2014. "From Progress to Happiness: Measurements for Latin America". *Social Change Review*, Summer 2014, Vol. 12(1): 73-112. DOI: 10.2478/scr-2014-0004

products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

The Gini coefficient is a statistical measure of the degree of variation represented in a set of values. When adjusting the GDP it captures income inequality (Source: World Bank).

- **Domestic Investment:** using the Gross Capital Formation in current *per capita* terms, which consists of outlays on addition to the fixed assets of the economy plus net changes in the level of inventories (Source: World Bank).
- **Composition Of Production:** using the Index by the Atlas of Economic Complexity. The complexity of an economy is related to the multiplicity of useful knowledge embedded in it. We can measure economic complexity by the mix of products that countries are able to make. (Source: The Observatory of Economic Complexity, MIT).
- **Entrepreneurship Ecosystem:** using the Global Entrepreneurship Index of GEDI that measures the health of the entrepreneurship ecosystems in countries. It then ranks the performance of these countries against each other; providing a picture of how each of them performs in both the domestic and international context. (Source: The Global Entrepreneurship and Development Institute)

Then we used the Pearson Correlation Coefficient, which is a measure of the linear dependence between two variables, to evaluate their correlations with the IPRI and its components. Most of the correlations¹⁸ found were significant and positively strong (see Table 9). We consider the following tranches or correlation ranges: None [0], Weak (0 - 0.3), Medium [0.3 - 0.5], Important [0.5 - 0.6], Good [0.6 - 0.8], Strong [0.8 - 1], Perfect [1].

GDP *per capita* correlations increased when it was adjusted by the Gini Coefficient, which is a measure of dispersion or inequality, giving to the GDP per capita a more adjusted measure in each country. This situation is valid for the IPRI and also for its components. The highest correlation was found for the IPRI and the adjusted GDP *per capita* (0.8392) followed by the IPR and the adjusted GDP *per capita* (0.8344) and the LP and the adjusted GDP *per capita* (0.8255).

Table 9. Pearson Correlation Coefficient

		IPRI	LP	PPR	IPR
Production	GDP <i>per capita</i> (constant 2010 USD)	0.8137	0.8214	0.6298	0.7875
	GDP <i>per capita</i> * GINI (constant 2010 USD)	0.8392	0.8255	0.6585	0.8344
Investment	Gross Capital Formation <i>per capita</i> (current USD)	0.7636	0.7672	0.6354	0.7073
Comp. Prod.	Economic Complexity	0.7204	0.7207	0.5137	0.7439
Entrepreneurship	Global Entrepreneurship	0.8781	0.8861	0.6903	0.8402

¹⁸Correlation theory is aimed to show the possible relationship, association or dependence between two or more observed variables. Besides it allows for the analysis of the type of association (direct or indirect) and the level or degree of intensity between them.

The relationship with domestic investments (Gross Capital Formation), showed for the LP a Pearson's of 0.7672 followed by the IPRI (0.7636), the IPR (0.7073) and the PPR (0.6354) component.

Domestic production composition (Economic Complexity) exhibited also a high Pearson's fit, IPR being the strongest with (0.7439), followed by the LP (0.7207), the IPRI (0.7204) and the PPR (0.5137) component.

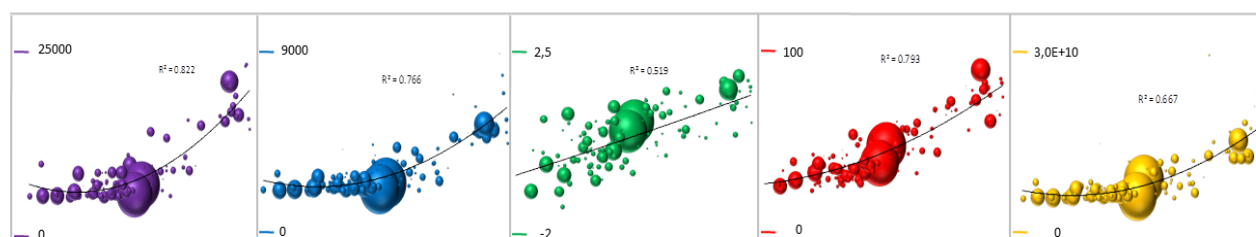
Of all the items, the entrepreneurial environment was the one with the highest correlations in this order: LP (0.8861), IPRI (0.8781), IPR (0.8402) and PPR (0.6903). This finding points to entrepreneurship as a building block of innovation, investment, production and economic growth.

Figure 20 reports that, on average, countries in the top quintile of IPRI scores (i.e. top 20%) show a *per capita* income almost 13 times that of the countries in the bottom quintile. Even though it is an important disparity, it has improved in time as in 2016 that inequality was almost 21 times and in 2015 almost 24 times. Statistics are based on the averages of IPRI-2017 scores and corresponding data on average GDP *per capita* in USD constant terms (2010=100, source: World Bank data) for the last available year.

These results reinforce the significant and positive relationship between prosperity and a property rights system, measured at an individual level. The statistical dispersion of the GDP distribution in each country was considered in this analysis using the GINI coefficient, which improved the correlations.

Figures 19a and 19b display the best fit curve for the IPRI and its components with each economic variable and the coefficients of determination¹⁹ (R^2). Figure 19a displays the relationship IPRI-economic outcomes showing countries with a population indicator. This reflects the huge proportion of population (represented by the radius of each circle) living in countries of middle level of IPRI and low to mid economic outcomes.

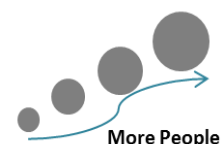
FIGURE 19a. IPRI Correlations with economic outcomes variables (with population information)



Legend

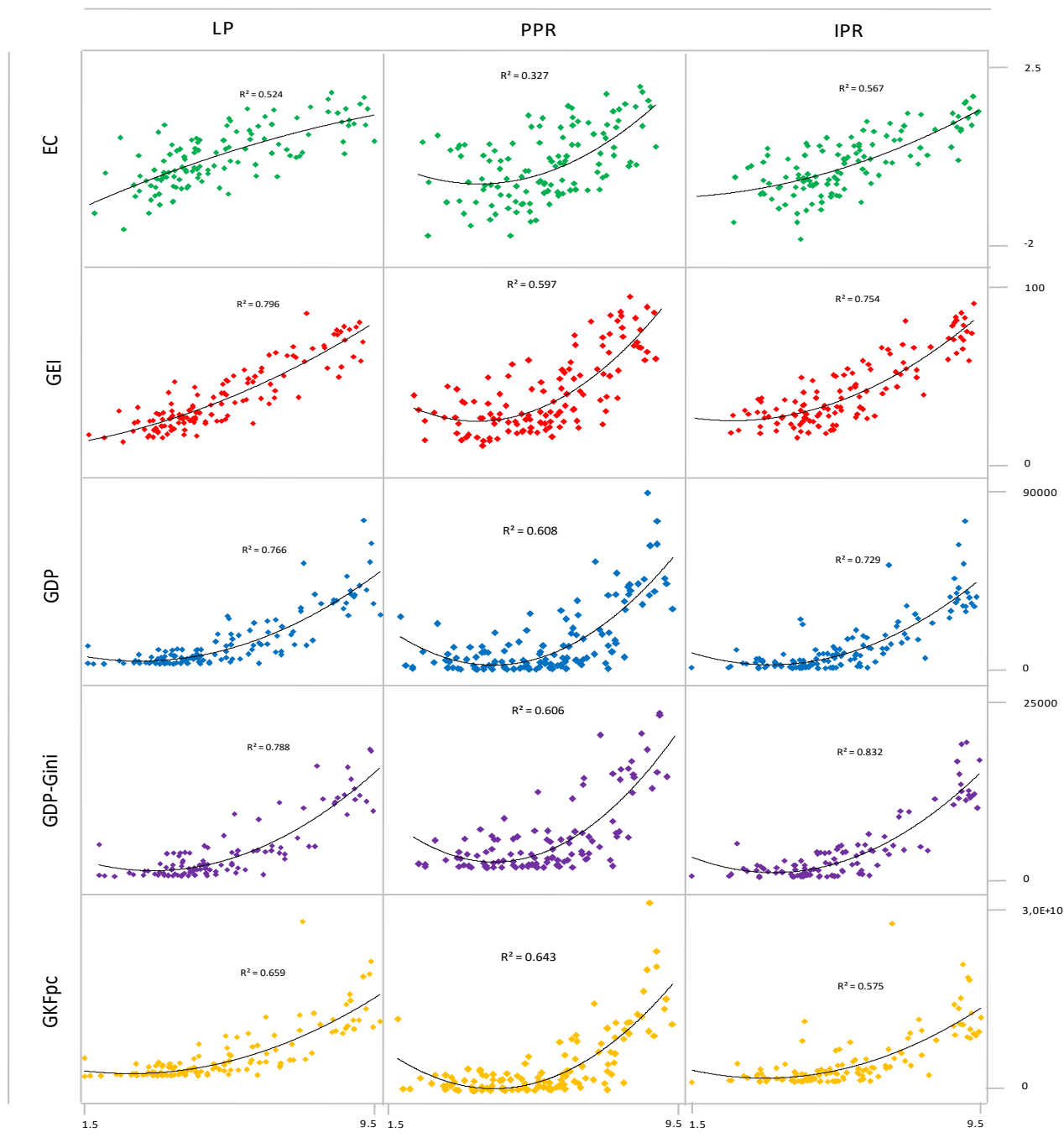
- IPRI vs GDP per capita * Gini (GDP-Gini)
- IPRI vs GDP per capita (GDP)
- IPRI vs Econ. Complexity (EC)

- IPRI vs Global Entrepreneurship Index (GEI)
- IPRI vs Gross capital formation *per capita* (GKFpc)



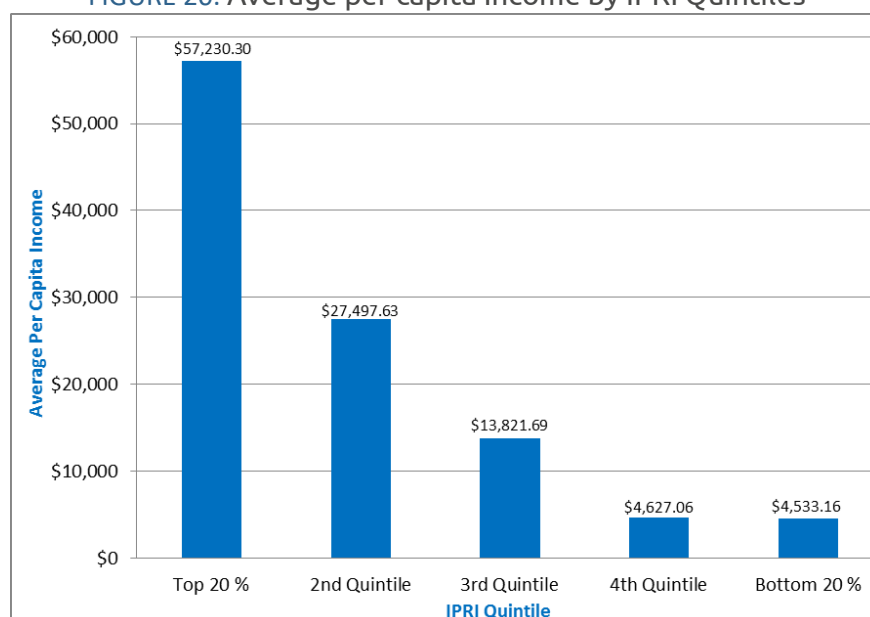
¹⁹The coefficient of determination (R^2) is a key output of the regression analysis. It is interpreted as the proportion of the variance in the dependent variable that is predictable from the independent variable. It ranges from 0 to 1.

FIGURE 19b. IPRI components correlations with economic variables



- ◆ IPRI Components vs Economic Complexity (EC)
- ◆ IPRI Components vs Global Entrepreneurship Index (GEI)
- ◆ IPRI Components vs GDP per capita (GDP)
- ◆ IPRI Components vs GDP per capita * Gini (GDP-Gini)
- ◆ IPRI Components vs Gross capital formation per capita (GKFpc)

FIGURE 20. Average per capita Income by IPRI Quintiles



VII.2. LIBERTIES

Approaches such as human development, sustainable development, systemic competitiveness and the new institutional economics are valuable contributions to a development perspective that - following Heilbroner & Milberg²⁰ - exposes the explicit indissoluble links between the economy and the underlying social order, relativizing its position, and recognizing that while development is possible, it is far from inevitable and may even be a reversible process.

Today, the reference paradigm is the one summarized as 'development as freedom', based on capabilities and opportunities, not on results. Under this new approach political, environmental and cultural dimensions, as well as subjective assessments are added to the traditional dimensions - such as technology and socioeconomics. Development as the increase of capabilities and opportunities becomes indissoluble from democracy and the republican condition of citizenship, valuing human rights, environmental sustainability, technological advance, emotions and cultures.

Through this perspective, the person moves from being a passive agent of decision-making and information reception to a genuine agent of change. These agents will be more active to the extent that they gain access to data and technology, and enjoy the guarantees for the free exercise of their freedoms in a given legal framework: A rule of law in which freedom has the unavoidable counterpart of responsibility.

To understand the relevance of liberties for development, the following elements were evaluated with the IPRI and its components:

- **Economic Freedom:** using two indices: the Index of Economic Freedom (IEF) by The Heritage Foundation and the Economic Freedom of the World Index, EFW, by Fraser Institute.

IEF documents the positive relationship between economic freedom and a variety of positive social and economic goals. The ideals of economic freedom are strongly associated with healthier

²⁰ Heilbroner, R., & W. Milberg. 1998. *La crisis de visión en el pensamiento económico moderno*. Barcelona: Paidós

societies, cleaner environments, greater *per capita* wealth, human development, democracy and poverty elimination. (<http://www.heritage.org/index/about>). It is composed of 10 economic freedoms, within 4 categories: [1] Rule of Law (property rights, freedom from corruption); [2] Limited Government (fiscal freedom, government spending); [3] Regulatory Efficiency (business freedom, labor freedom, monetary freedom); and [4] Open Markets (trade freedom, investment freedom, and financial freedom). The IEF considers every component equally important in achieving the positive benefits of economic freedom. Each freedom is weighted equally in determining country scores

EFW measures the degree to which the policies and institutions of countries are supportive of economic freedom. In recent years, social scientists have focused on the identification and measurement of the impact of economic, political, legal, and cultural factors in the growth and development of economies. The EFW data set provides a comprehensive measure of the degree to which countries rely on voluntary exchange and market institutions to allocate resources. It has five dimensions: [1] Size of Government; [2] Legal System and Security of Property Rights; [3] Sound Money; [4] Freedom to Trade Internationally, and [5] Regulation. The EFW index covers 157 countries with data available for approximately 100 countries back to 1980. This data set enables scholars to analyze the impact of both cross-country differences in economic freedom and changes in that freedom across a time frame of more than three decades. (<http://www.freetheworld.com/>).

- **Political Freedom:** using the Political Rights dimension of the Freedom in the World Index, FW, by the U.S.-based non-governmental organization Freedom House.

FW assesses the real-world rights and freedoms enjoyed by individuals, rather than governments or government performance per se. It is a result of a yearly survey that reports the degree of civil liberties and political rights in every nation and significant disputed territories around the world. It produces annual scores representing the levels of political rights and civil liberties in each state and territory, on a scale from 1 (most free) to 7 (least free). Depending on the ratings, the nations are then classified as "Free", "Partly Free", or "Not Free". (<https://freedomhouse.org/report-types/freedom-world>). It has two dimensions: Political Rights and Civil Liberties.

In its Political Rights Dimension countries and territories with a rating of 1 enjoy a wide range of political rights, including free and fair elections. Candidates who are elected actually rule, political parties are competitive, the opposition plays an important role and enjoys real power, lastly, the interests of minority groups are well represented in politics and government. On the opposite, countries and territories with a rating of 7 have few or no political rights because of severe government oppression, sometimes in combination with civil war. They may also lack an authoritative and functioning central government and suffer from extreme violence or rule by regional warlords.

- **Civil Freedom:** using the Civil Liberties Dimension of the Freedom in the World Index by the U.S.-based non-governmental organization Freedom House.

In the Civil Liberties Dimension countries and territories with a rating of 1 enjoy a wide range of civil liberties, including freedoms of expression, assembly, association, education, and religion; they have an established and generally fair legal system that ensures the rule of law (including an independent judiciary), allow free economic activity, and tend to strive for equality of opportunity for everyone, including women and minority groups. At the other end, countries and territories with a rating of 7 have few or no civil liberties. They allow virtually no freedom of expression or association, do not protect the rights of detainees and prisoners, and often control or dominate most economic activity

The gap between political rights and civil liberties ratings is rarely more than two points. Politically oppressive states typically do not allow a well-developed civil society, for example, and it is difficult, if not impossible, to maintain political freedoms in the absence of civil liberties like press freedom and the rule of law.

- **Absence of Coercion:** using The Human Freedom Index, HFI (by Cato, Fraser and Visio Institute. <https://www.cato.org/human-freedom-index>)

HFI presents a broad measure of human freedom, understood as the absence of coercive constraint (based on the "negative" definition of freedom that prevents individuals from acting as they might wish), which includes economic freedom. It suggests that freedom plays an important role in human well-being, and offers opportunities for further research into the complex ways in which freedom influences, and can be influenced by, political regimes, economic development, and the whole range of indicators of human well-being. The index uses 76 distinct indicators gathered in two dimensions: personal (34) and economic (42) freedom, distributed in the following areas: [1] Rule of Law; [2] Security and Safety; [3] Movement; [4] Religion; [5] Association, Assembly, and Civil Society; [6] Expression; [7] Relationships; [8] Size of Government; [9] Legal System and Property Rights; [10] Access to Sound Money; [11] Freedom to Trade Internationally and [12] Regulation of Credit, Labor, and Business.

- **Connectivity:** using The Networked Readiness Index, NRI, by The World Economic Forum, INSEAD.

NRI measures the propensity for countries to exploit the opportunities offered by information and communications technology (ICT). The report is regarded as the most authoritative and comprehensive assessment of how ICT impacts the competitiveness and well-being of nations (<http://reports.weforum.org/global-information-technology-report-2015>). It is a composite index made up of four main categories (sub-indexes), 10 subcategories (pillars), and 53 individual indicators, as follows: [1] Environment (Political and regulatory environment (9 indicators) and Business and innovation environment (9 indicators)); [2] Readiness (Infrastructure (4 indicators); Affordability (3 indicators) and Skills (4 indicators)); [3] Usage (Individual usage (7 indicators); Business usage (6 indicators) and Government usage (3 indicators)) and [4] Impact (Economic impacts (4 indicators) and Social impacts (4 indicators)).

We found significant, positive and important to strong correlations between IPRI and its components with previous indices (Table 10). The strongest Pearson's coefficient was with NRI, the closest fit with LP (0.881), followed by the IPRI itself (0.857), IPR (0.812) and PPR (0.678). The next closest score was the IEF, with good to strong correlations, then the HFI, EFW, FW-Civil Dimension and FW-Political Dimension. In all of these indices the highest correlations were with the LP component, followed by the IPRI itself, then IPR and finally the PPR component. PPR displays medium levels of correlations with HFI and FW. These results could be also seen in Figures 21a and 21b.

Political Freedom variables – Political Rights and Civil Liberties of the Freedom of the World Index by Freedom House are composed of numerical ratings running from 1-7²¹, this way it could be considered a discrete item, therefore, it is not appropriate to evaluate correlations mathematically (Pearson's correlation) as they generate tremendous dispersions and a correlation bias. However, this does not prevent conjectures based on their behavior related to the IPRI. In Figures 21a and 21b, the dot cloud generated by combining both measurements can be seen. In that sense, without having

²¹ These variables run in opposite direction of the IPRI. For this reason their direction was adjusted.

a mathematical measure of its correlation, a general positive linear relationship can be observed between political rights and civil liberties with property rights.

Table 10. Pearson's Correlation Coefficients

	Economic		Abs. Coercion	Connectivity
	IEF	EFW	HFI	NRI
IPRI	0.768	0.675	0.732	0.857
LP	0.812	0.722	0.792	0.881
PPR	0.633	0.576	0.499	0.678
IPR	0.669	0.565	0.708	0.812

Figure 21a. IPRI Correlation with Freedom measures (with population information)

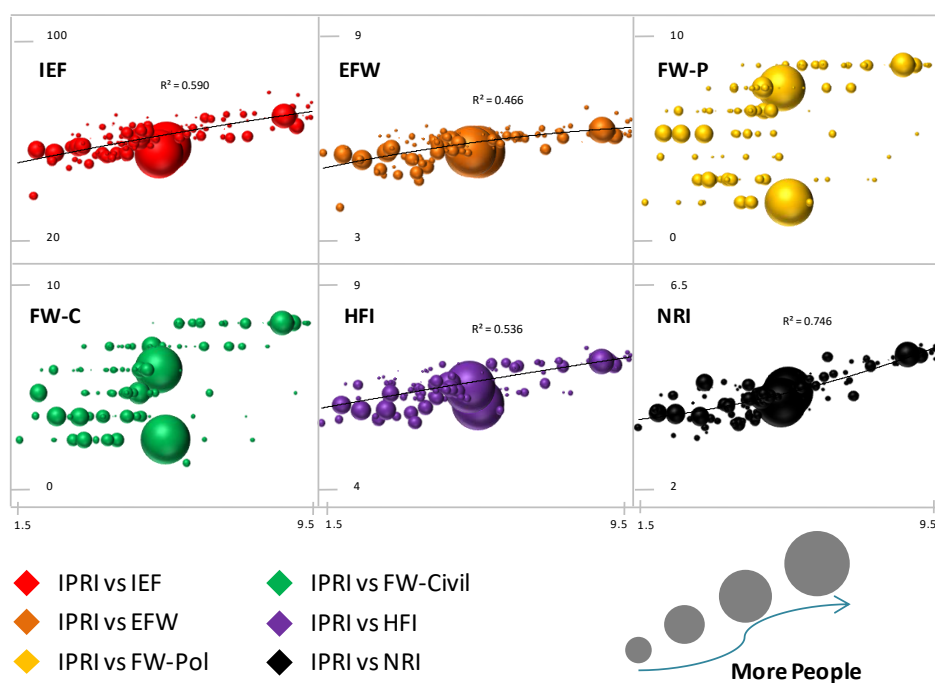
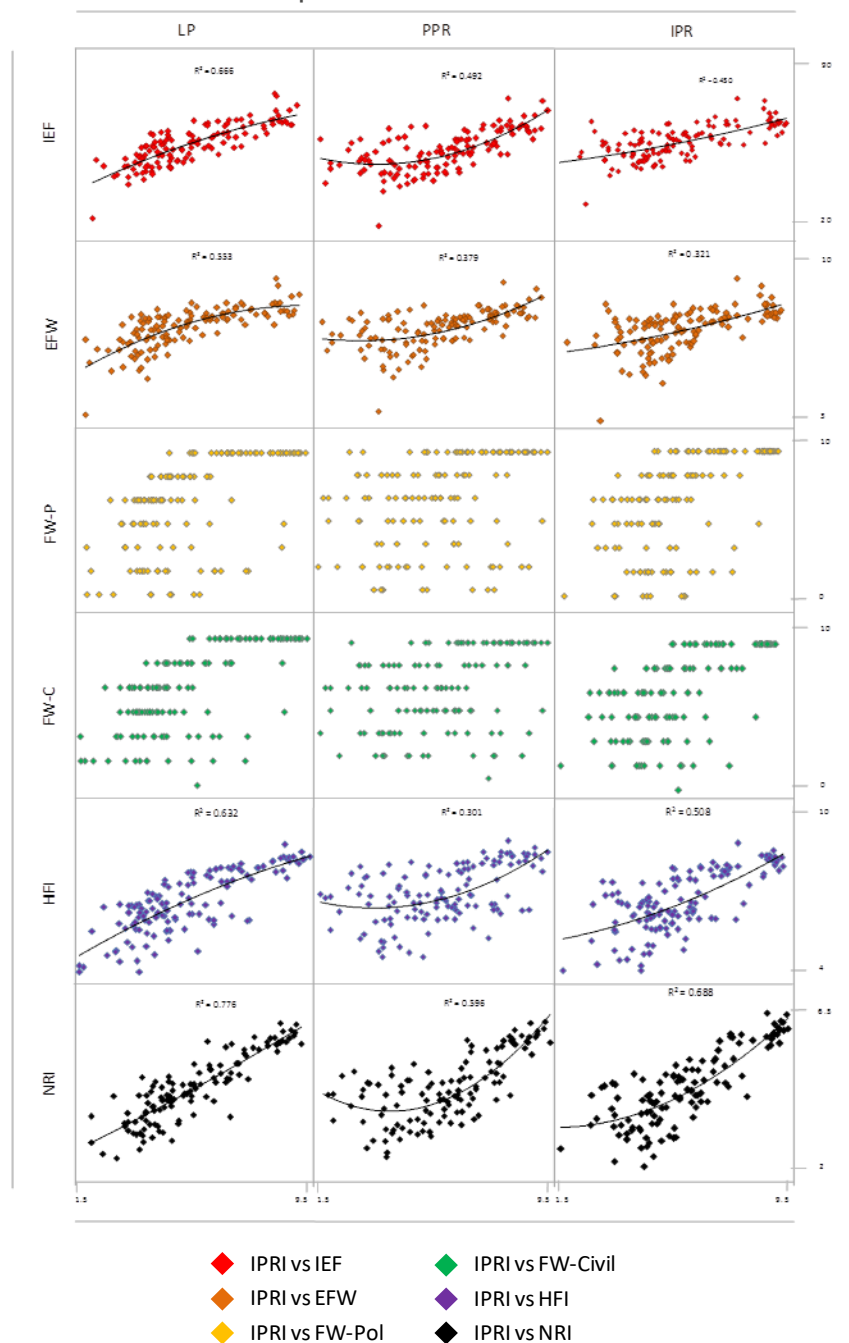


FIGURE 21b. IPRI Component Correlations with Freedom Indices



VII.3. Human Capabilities

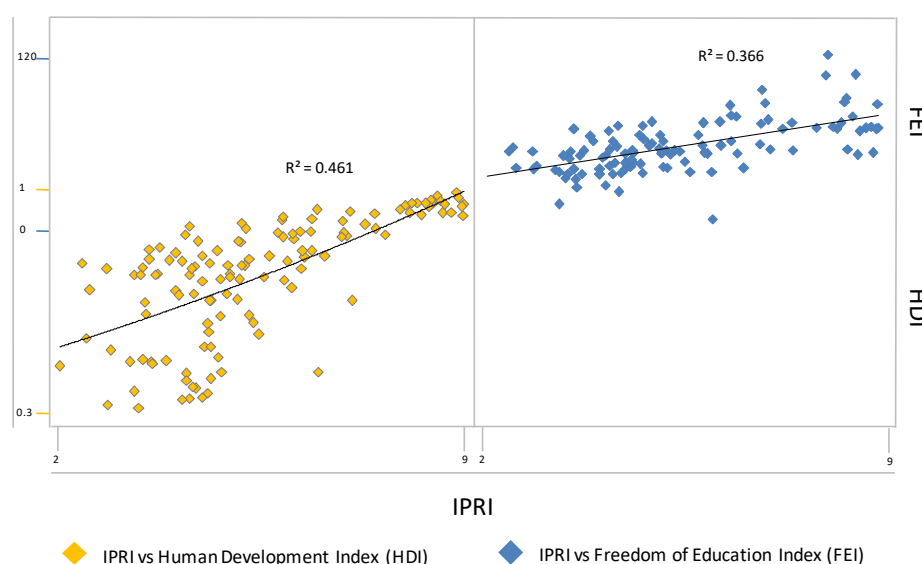
The pivotal element of the development equation is the people, and consequently their capabilities. For this dimension two elements were considered for evaluation:

- Current condition: using the Human Development Index (UNDP, <http://hdr.undp.org/en/data>) which has three dimensions: long and healthy life, being knowledgeable and a decent standard of living.
- Future potential: using the Global Index on Freedom of Education, which includes a set of data on international scale analyzing the protection and promotion of this fundamental human right, as well as policies in support of freedom of education in the national context and in other countries. The indicators focus on: freedom of choice for children's education (constitutional and legislative requirements, public schools, home schooling); public support for freedom of education (family vouchers, direct support for schools, teachers' wages, costs of structures and buildings etc.); NET (Net Enrolment Rate): the participation rate in a certain stage of children's and young people's education; Rate of students' participation in comprehensive schools (<http://www.novaeterrae.eu/en/>).

FIGURE 11. Pearson's Correlation Coefficients

	Current HDI	Future GIFE
IPRI	0.679	0.605
LP	0.738	0.590
PPR	0.477	0.477
IPR	0.638	0.610

FIGURE 22. IPRI Correlations with Human Capability Variables



The correlations found were significant and positive, they ranged from medium to good fits (See Table 11). The HDI showed higher correlations than the GIFE; and while the first is higher for LP (0.738) and followed by IPRI (0.679) and IPR (0.638), the GIFE is higher for IPR (0.610), as creative capabilities will be enhanced by the enjoyment of freedoms and for guarantees on intellectual property rights, followed by IPRI (0.605) and LP (0.59). The best fit curve for the indices and the coefficient of determinations is shown in Figure 22.

VII.4. Social Capital

Social capital has different definitions: it is understood as the network of relationships among people who live and work in a particular society, enabling that society to function effectively; or to undertake collective social action. Social capital is built upon trust, reciprocity, cooperation, assistance, support, interdependence, interaction, dialogue, involvement and participation (Jaffé, Levy-Carciente & Zanoni, 2007).²² Given the importance of having people as the axis around which the development concept and policies should rotate the Social Capital sub-index of the Prosperity Index by Legatum (<http://www.li.com>) and a group of variables from the International Institute of Social Studies (<http://www.indsocdev.org>) were used to assess the relationship between social capital and the IPRI:

- Social Capital component of the Prosperity Index, by Legatum: this sub-index measures a country's performance in two areas: social cohesion and engagement, and community and family networks. Variables: perceptions of social support, volunteering rates, helping strangers, charitable donations, social trust, marriage and religious attendance.
- Civic activism: refers to the social norms, organizations, and practices which facilitate greater citizen involvement in public policies and decisions. These include access to civic associations, participation in the media, and the means to participate in civic activities such as nonviolent demonstrations or petitions.
- Intergroup cohesion: refers to relationships of cooperation and respect between identity groups in a society. When this closeness breaks down, the potential arises for conflict such as killings based on ethnicity, religion, or race, motivated killings, targeted assassinations and kidnappings, acts of terror such as public bombings or shootings, or riots involving grievous bodily harm to citizens, with concomitant effects upon growth and development.
- Interpersonal safety and trust: Interpersonal norms of trust and security exist to the extent that individuals in a society feel they can rely on those whom they have not met before. Where this is the case, the costs of social organization and collective action are reduced. Where these norms do not exist, or have been eroded over time, it becomes more difficult for individuals to form group associations, undertake an enterprise, and live safely and securely.
- Inclusion of minorities: measures levels of discrimination against vulnerable groups such as indigenous peoples, migrants, refugees, or lower caste groups. This measure focuses upon whether there is systemic bias among managers, administrators, and members of the community in the allocation of jobs, benefits, and other social and economic resources regarding particular social groups.

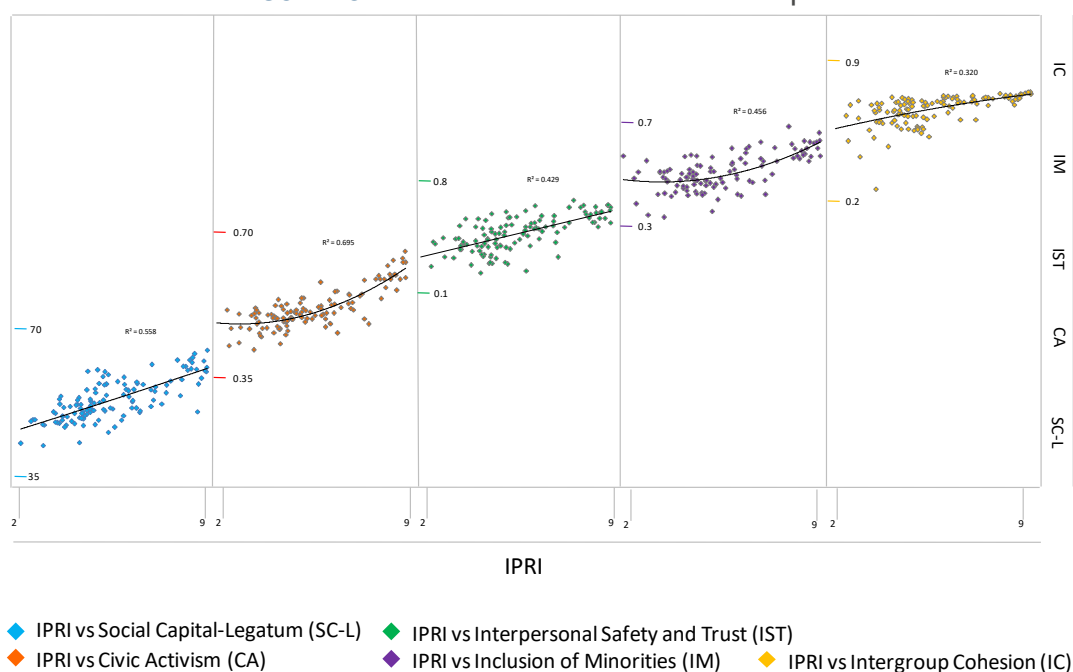
We evaluated their correlation with the IPRI and its components (see Table 12 and Figure 23) and the strongest correlations were found between Civic Activism and the IPR (0.8098) followed by the IPRI (0.8013) and the LP (0.7995). The Social Capital component of the Prosperity Index by Legatum showed good correlations with the IPRI (0.747), LP (0.711), PPR (0.694) and the IPR (0.685). Interpersonal Safety & Trust, Inclusion of Minorities and Intergroup Cohesion displayed good correlations (0.6-0.8), especially with LP and IPRI.

²² Jaffé, K.; S. Levy-Carciente; W. Zanoni. 2007. "The Economic Limits of Trust: The Case of Latin-American Urban Informal Commerce Sector" *Journal of Developmental Entrepreneurship*, Vol. 12, Sep(3):339-35.

Table 12. Pearson's Correlation Coefficients

		IPRI	LP	PPR	IPR
Social Capital	Social Capital component (Prosperity Index)	0.7471	0.7108	0.6936	0.6854
	Civic Activism	0.8013	0.7995	0.6050	0.8098
	Intergroup Cohesion	0.5645	0.6312	0.3935	0.5233
	Interpersonal Safety & Trust	0.6555	0.7120	0.4976	0.5951
	Inclusion of Minorities	0.6347	0.6739	0.4449	0.6181

FIGURE 23. IPRI Correlations with Social Capital



VII.5. Research and Innovation

In a 'knowledge society' structures and processes of material and symbolic reproduction are so immersed in knowledge operations that information processing, symbolic analysis and expert systems take precedence over other factors like capital and labor. Hence, innovation is a key block in a knowledge society. Using the World Bank data for research and innovation (<http://wdi.worldbank.org/>) we ran correlations of the IPRI and its component with three items:

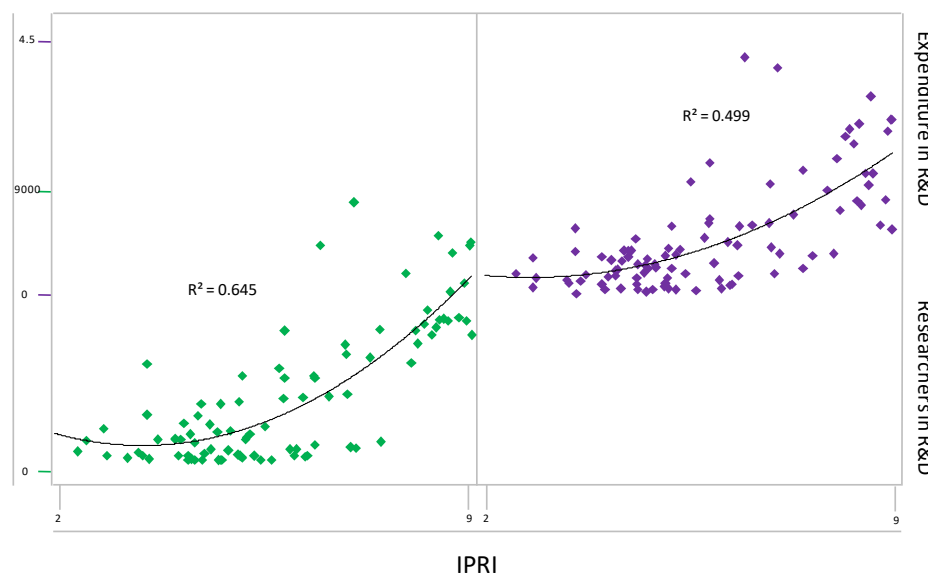
- Full time researches *per* million people: professionals engaged in the conception or creation of new knowledge, products, processes, methods, or systems and in the management of the projects concerned. It includes postgraduate PhD students (ISCED97 level 6) engaged in R&D (<http://data.worldbank.org/indicator/SP.POP.SCIE.RD.P6>).
- Research and development expenditure as % of GDP: Expenditures for R&D are current and capital expenditures (both public and private) on creative work undertaken systematically to increase knowledge, including knowledge of humanity, culture, and society, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development (<http://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS>).
- Scientific and technical journal articles: Number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences (<http://data.worldbank.org/indicator/IP.JRN.ARTC.SC>).

The number of researchers engaged in R&D had the highest correlation, it was with the IPR component (0.796), followed by the IPRI (0.761) and LP (0.752). Then comes the correlation between R&D expenditure and the IPR (0.758), followed by the IPRI (0.685) and LP (0.635). The PPR showed medium correlations with R&D expenditure. The number of published scientific papers showed positive but weak to moderate correlations.

Table 13. Pearson's Correlation Coefficients

		IPRI	LP	PPR	IPR
Research & Innovation	Researchers in R&D (per million people)	0.7607	0.7522	0.5528	0.796
	Research & Development expenditure (%of GDP)	0.6851	0.6349	0.4948	0.7582
	Scientific and Technical Journal Skills	0.2646	0.1929	0.2302	0.3164

Figure 24. IPRI Correlations with R&D Variables



- ◆ IPRI vs Researchers in R&D (per million people)
- ◆ IPRI vs Research and development expenditure (% of GDP)

VII.6 Ecological Performance

The ecological environment is decisive for sustainable development. It is referenced in the recent Paris international climate change agreement dealing with greenhouse gases emissions mitigation, adaptation and finance starting in the year 2020. Given ecological performance relevance, we ran correlations of the IPRI with the Environmental Performance Index, developed by Yale University (EPI-Yale):

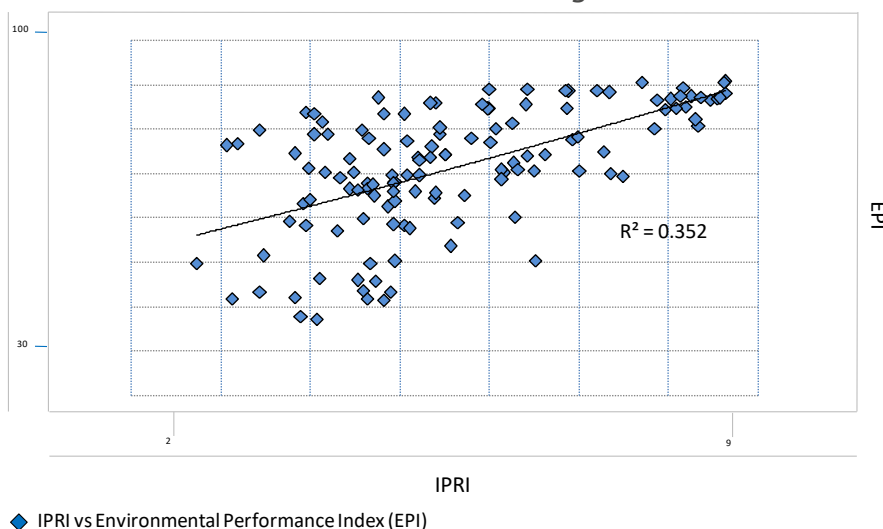
- The EPI-Yale provides a global view of environmental performance and country by country metrics to inform decision-making. It ranks country performance based on their response to high-priority environmental issues in two areas: protection of human health and protection of ecosystems (<http://epi.yale.edu/country-rankings>). See Table 14 & Fig. 25.

Table 14. Pearson's Correlation Coefficient

	EPI-Yale
IPRI	0.5937
LP	0.6481
PPR	0.3952
IPR	0.5740

We found important positive correlations among the EPI and IPRI and its components²³ being the strongest with LP (0.648) and the lowest with PPR (0.395). These results may indicate that to the extent that a society has stronger property rights the more capacity it has to apply appropriate policies protecting health and the environment through the conservation and protection of the ecosystem.

FIGURE 25. IPRI Correlations with Ecological Measurements



VIII. IPRI Cluster Analysis

Cluster analysis aims to group similar entities into clusters. It classifies individuals into groups as homogeneous as possible based on observed variables.

The cluster analysis was performed for all 127 countries according to their values in LP, PPR and IPR. Additionally, we included illustrative variables that do not influence the formation of the cluster but will bring an important contribution to describe them²⁴. Those variables were the ones we used to calculate correlations (chapter VII), mainly to expose the conditions or features in the resulting clusters.

In order to seize the variability in the analysis -given the great differences among the countries in the IPRI- we used Ward's Method²⁵ with squared Euclidean distance that groups countries with minimal loss inertia.

In a first moment, a Principal Component Analysis (PCA) was applied with the aim of handling variables by factors, given the high correlation among them. The results of the PCA express that the three components of the IPRI (LP, PPR, IPR) define a dimension, that was called IPRI, which collects 85.90% of the inertia. The second and third factors - with inertias of 9.64% and 4.46% respectively - are the residue of the inertia. These entities do not contribute to the first factor inertia and are generally very close to the origin of the first factor. They could be subdivided into groups more

²³ Same result can be found at: <http://marketmonetarist.com/2015/12/01/coase-was-right-the-one-graph-version/>, following that well defined property rights are the best way to manage economic externalities.

²⁴We used the statistical software SPAD® which allows the inclusion of illustrative variables in the analysis.

²⁵Ward's Method joins cases looking for minimizing the variance within each group, creating homogeneous groups. First, it calculates the media of all variables in each cluster, then the distance between each case and the cluster' media, that will be added. Subsequently, clusters are grouped in a way to minimize increases in the sum of distances inside each cluster.

associated to the PPR dimension –defining the second factor – and those more associated to LP and IPR defining the third factor.

Next, we used the mobile centers algorithm to show the inertia within groups and the criteria to decide the optimal number of classes or clusters (see Table 15).

Table 15. Cluster Analysis

Cluster	Inertia	Countries	Distance of Centroids to origin	Coordinates of centroids		
				Factor 1	Factor 2	Factor 3
Inter-classes	2.24463					
Intra-classes						
Class 1 / 3	0.42639	59	1.88387	-1.36920	-0.09265	-0.02407
Class 2 / 3	0.25030	43	0.18583	0.38237	0.19212	0.05211
Class 3 / 3	0.07868	25	6.63714	2.57363	-0.11178	-0.03282

The analysis showed that the three clusters were sufficient to explain the grouping of countries, more specifically, where the observed inertia within each group does not exceed the inertia among groups. In this sense the clusters are formed as shown in Table 16 and illustrated in Figure 26.

Although the first factor contains 85.90% of inertia, which is enough to illustrate the formation of the clusters, Fig. 26 illustrates Factors 1 and 2 as well as the three clusters centroids (yellow). Cluster 1 (red) displays countries located in the negative coordinates of the first factor includes countries with low values of the LP, PPR and IPR. Cluster 2 (green) includes countries placed very close to the origin, showing average values of the LP, PPR and IPR. Cluster 3 (blue) contains countries located in the positive coordinates of the first factor and its members are linked to high values of the LP, PPR and IPR. The second factor consists mostly of countries in Cluster 2, including those whose scores are very close to the average, including both neighboring countries between Cluster 2 and Cluster 1, and those neighboring Cluster 2 and Cluster 3. Cluster 1 and Cluster 3 are outright opposites and their individuals are not directly associated with each other.

It is important to emphasize that in comparing this year's clusters with those in the previous edition (IPRI 2016) we find a significant translation of most of the countries to an improved position (see also Fig. 16). Therefore, it is expected that the cluster's centroids will move to the right, as it has occurred in this IPRI edition. This situation explains the fact that some countries that in 2016-IPRI were in Cluster 3, now appear in Cluster 2, while showing similar or even improved scores, but with a lesser improvement than the average of the Cluster. Clear examples of this situation are: Chile, Czech Rep., Malta, Portugal and South Africa which last year belonged to Cluster 3 and this year belong to Cluster 2, all of these countries improved their IPRI scores.

Besides the clusters, Figure 26 also shows the contribution of each country explaining the inertia gathered by the factors, hence the bigger the dot size representing the country, the higher its contribution. Very close countries show how they are similar and how they differ as the distance increases between them.

In the central circle are those countries that have no-statistically significant contribution to the definition of the factors, and as it has already been mentioned that they are close to the average and are mostly members of Cluster 2. In addition, arrows represent each of the three dimensions of the IPRI, their definite direction indicates the direct relationship with the individuals, i.e., as countries are in the same direction of the vector, countries tend to have a closer relationships with this

dimension; and as a country direction diverts from the vector, the relationship between the country decreases to point of being contrary to it. This can be exemplified with the case of Brunei Darussalam, which is totally opposite to the direction of vector PPR which coincides with its low score in this sub-index.

Subsequently, clusters composition using income, population, participation in economic and regional integration agreements and regional and development criteria are shown in Fig. 27a-27d, where font size represent the frequency of the groupings in the cluster.

The analysis of each cluster can describe the internal characteristics of the countries within it. In this regard Table 16 exhibits the features that are statistically significant²⁶ in each group. Additional statistics are shown in Table 17 and Appendix IV.

²⁶To be statistically significant the value must be less or equal -1.96 or greater or equal 1.96

FIGURE 27.Clusters' Members and Centroids. Factor 1 and Factor 2.

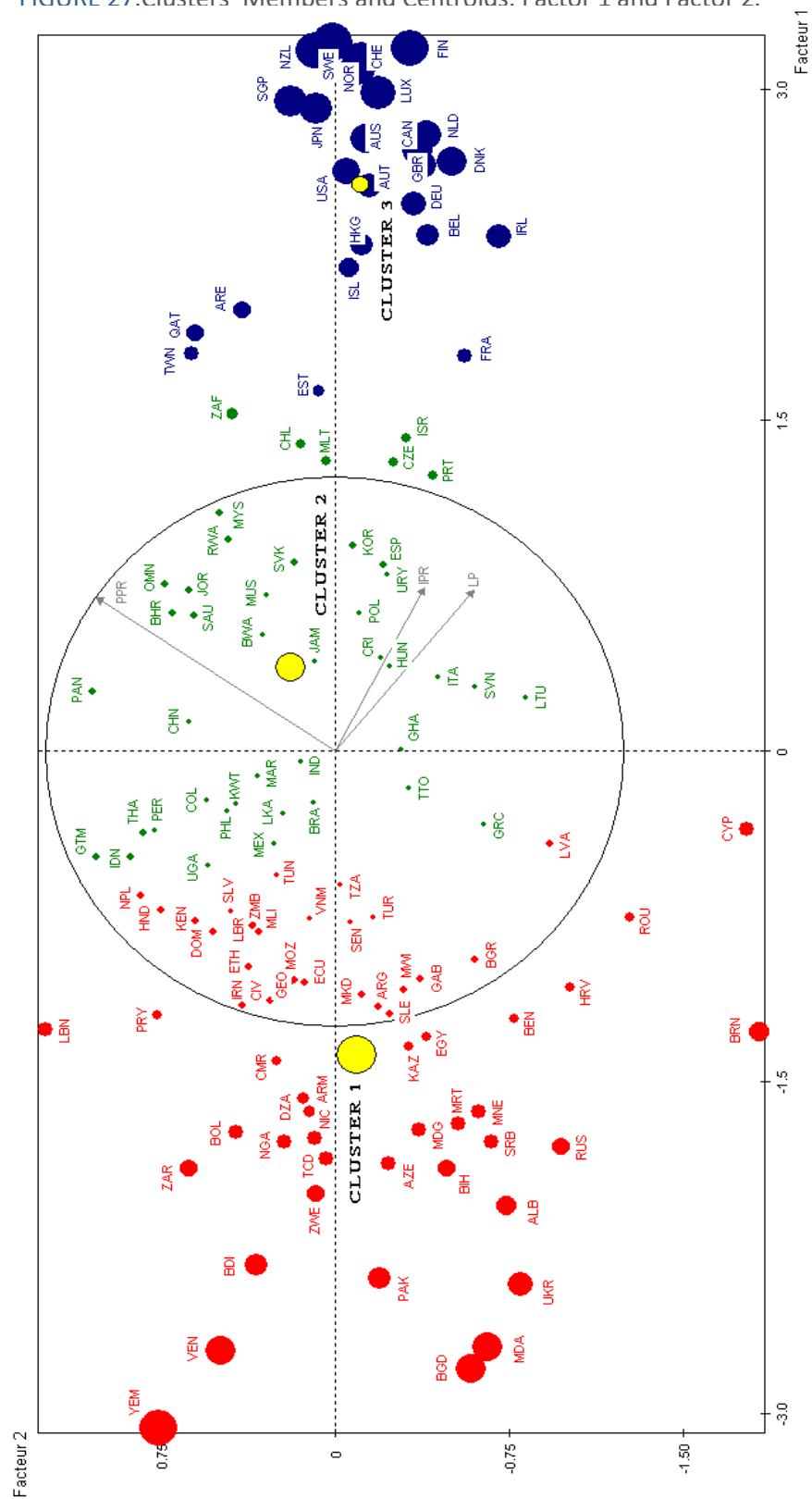


FIGURE 27a. Cluster Composition by Income Classification

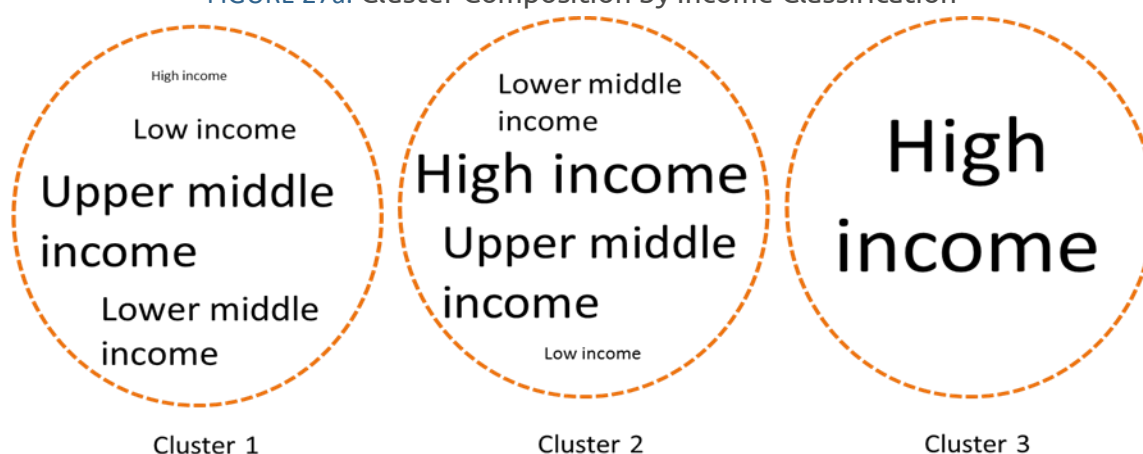


FIGURE 27b. Cluster Composition by Regional and Development Criteria



FIGURE 27c. Cluster Composition and Population weight (thousands)

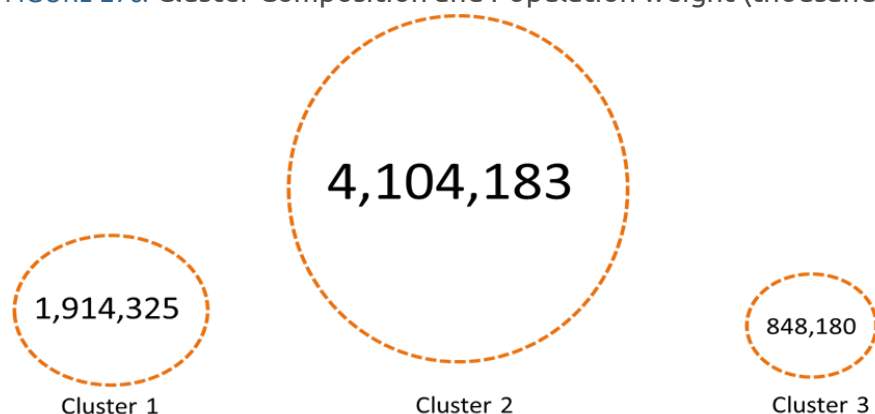


FIGURE 27d. Cluster Composition by Economic and Regional Integration Agreements

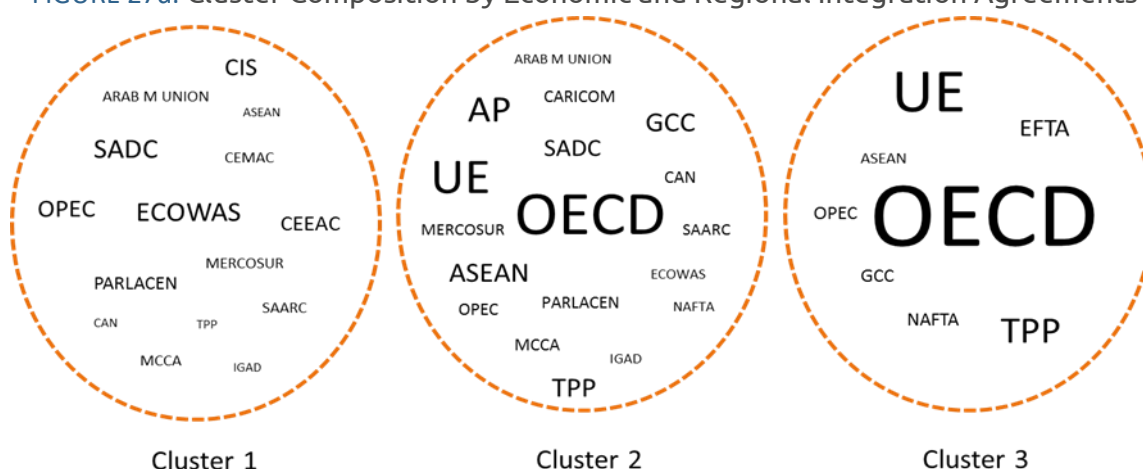


Table 16. Cluster Statistics

Cluster 1			Cluster 2			Cluster 3		
Characteristic Variables	Value-Test	Probability	Characteristic Variables	Value-Test	Probability	Characteristic Variables	Value-Test	Probability
Pob	-1.32	0.093	PPR	2.94	0.002	GDP	9.41	0.000
IM	-3.15	0.001	Pob	1.94	0.026	GKFpc	8.99	0.000
IC	-3.65	0.000	HDI	1.79	0.037	GDPG	8.79	0.000
Gen	-3.75	0.000	EF-F	1.76	0.039	GEI	8.78	0.000
E.R&D	-4.25	0.000	EC	1.72	0.043	LP	8.76	0.000
R.I&D	-4.39	0.000	IPR	1.65	0.049	IPRIGE	8.63	0.000
PR	-4.46	0.000	IPRIGE	1.60	0.055	IPR	8.50	0.000
CL	-4.94	0.000	EPI	1.51	0.065	NRI	8.12	0.000
IST	-4.94	0.000	SC-L	1.49	0.068	CA	8.08	0.000
CA	-5.44	0.000	FEI	1.28	0.100	PPR	7.49	0.000
FEI	-5.51	0.000	PR	1.27	0.103	EF-H	6.94	0.000
EPI	-5.51	0.000	EF-H	1.11	0.133	R.I&D	6.83	0.000
GKFpc	-5.74	0.000	CL	1.05	0.148	SC-L	6.77	0.000
HFI	-5.91	0.000	HFI	0.84	0.199	HFI	6.38	0.000
GDPG	-5.91	0.000	LP	0.78	0.218	EC	6.05	0.000
GDP	-6.06	0.000	Gen	0.50	0.309	E.R&D	5.97	0.000
EF-F	-6.14	0.000	NRI	0.39	0.349	HDI	5.83	0.000
HDI	-6.29	0.000	IST	0.19	0.425	IM	5.82	0.000
EC	-6.30	0.000	GEI	-0.17	0.434	IST	5.80	0.000
EF-H	-6.61	0.000	IC	-0.54	0.293	EF-F	5.61	0.000
SC-L	-6.79	0.000	GDPG	-0.71	0.239	FEI	5.45	0.000
GEI	-6.89	0.000	E.R&D	-1.09	0.137	IC	5.19	0.000
NRI	-7.03	0.000	CA	-1.17	0.120	EPI	5.18	0.000
LP	-7.72	0.000	GDP	-1.42	0.077	CL	4.95	0.000
IPR	-8.34	0.000	GKFpc	-1.44	0.075	Gen	4.12	0.000
IPRIGE	-8.38	0.000	IM	-1.65	0.050	PR	4.08	0.000
PPR	-8.76	0.000	R.I&D	-1.74	0.041	Pob	-0.65	0.257

Statistically significant only if Value-Test $\geq |1.96|$

Table 17. Illustrative Variables. Averages by Clusters

	Cluster 1	Cluster 2	Cluster 3
Total Countries	59	43	25
Total Population (Thousand)	1,914,325.8	4,104,183.7	848,180.4
Average IPRI	4.37	5.97	8.04
Average LP	3.83	5.35	8.04
Average PPR	5.09	6.72	8.06
Average IPR	4.19	5.84	8.02
Average Gen	6.61	7.58	9.16
Average IPRIGE	5.69	7.47	9.90
Average GDP	4,978.8	13,298.5	53,029.5
Average GDP-Gini	154,640.3	430,190.6	1,601,494.8
Average GKFpc	1,132,703,884.7	2,901,979,289.9	11,851,455,269.0
Average EC	-0.34	0.43	1.32
Average GEI	22.00	34.49	65.09
Average EF-H	57.44	65.23	76.31
Average EF-F	6.48	7.15	7.81
Average PR	4.97	6.94	8.87
Average CL	5.17	6.90	9.07
Average HFI	6.48	7.17	8.24
Average NRI	3.55	4.26	5.53
Average FEI	50.96	59.21	69.37
Average HDI	0.64	0.76	0.90
Average SC-L	46.57	52.77	60.55
Average CA	0.49	0.52	0.60
Average IC	0.65	0.68	0.76
Average IST	0.41	0.47	0.60
Average IM	0.45	0.47	0.56
Average E.R&D	0.46	0.90	2.08
Average R.I&D	714.82	1,548.15	4,693.75
Average EPI	64.2	74.0	84.7

Table 18. Regional Integration Agreements and Cluster

Regional Integration Agreements		Total	Cluster 1	%	Cluster 2	%	Cluster 3	%
OECD	Organisation for Economic Cooperation and Development	35	2	5.71	13	37.14	20	57.14
EU	European Union	28	5	17.86	11	39.29	12	42.86
SADC	Southern African Development Community	10	7	70.00	3	30.00		
ECOWAS	Economic Community Of West African States	8	7	87.50	1	12.50		
ASEAN	Association of Southeast Asian Nations	7	2	28.57	4	57.14	1	14.29
PARLACEN	Central American Parliament	6	4	66.67	2	33.33		
GCC	Gulf Cooperation Council	6			4	66.67	2	33.33
AP	Pacific Alliance	6			6	100.00		
MERCOSUR	Southern Common Market	5	3	60.00	2	40.00		
SAARC	South Asian Association for Regional Cooperation	5	3	60.00	2	40.00		
CEMAC	Central African Economic and Monetary Community	3	3	100.00				
MCCA	Central American Common Market	5	3	60.00	2	40.00		
CIS	Commonwealth of Independent States	6	6	100.00				
ARAB M UNION	Arab Mahgreb Union	4	3	75.00	1	25.00		
CARICOM	Caribbean Community	2			2	100.00		
CAN	Andean Community	4	2	50.00	2	50.00		
EFTA	European Free Trade Association	3					3	100.00
IGAD	Intergovernmental Authority on Development	3	2	66.67	1	33.33		
NAFTA	North American Free Trade Agreement	3			1	33.33	2	66.67
OPEC	Organization of the Petroleum Exporting Countries	10	6	60.00	2	20.00	2	20.00
CEEAC	La Communauté Economique des Etats de l'Afrique Centrale	6	5	83.33	1	16.67		
TPP	Trans-Pacific Partnership	12	2	16.67	4	33.33	6	50.00

VIII.1. Cluster Description

Cluster 1

Cluster 1 is composed of 59 countries with a population of more than 1.9 billion people. The country closest to its centroid is Algeria, followed by Egypt, Macedonia, Kazakhstan and Argentina. Cyprus is by far the most remote country of the Cluster, followed by Yemen, Brunei Darussalam, Bangladesh, Moldova and Venezuela.

A close look at Cluster 1 and the country coordinates reveal that Tunisia and Tanzania are the closest to the Cluster 2 Centroid. Looking simultaneously to Cluster 1 and Cluster 2, the closest countries are Tunisia (Cluster 1) and Mexico (Cluster 2), which signifies similarity in conditions (see Fig. 26).

Countries in Cluster 1 are statistically significant for LP, PPR and IPR components with low scores in each category. The same is true for the Gender component and the IPRI-GE. Cluster 1 countries also show low levels in all the dimensions we analyzed, that is, they show poor performances in Economic outcomes, Human Capabilities, Social Capital, Research and Innovation, Ecological Performance and Liberties. We may hypothesize that this is the result of the lack of policy to improve key elements such as entrepreneurship, social opportunities, levels of liberty, social capital, or research and development.

Under the regional and development classifications of the IMF and the income groupings of the World Bank, the Sub-Saharan Africa group and the Upper-Middle-Income, Lower-Middle-Income and Low-Income groups are highly represented in this cluster.

The Southern African Development Community (7/10 members) and the Economic Community of West African States (7/8 members) have most of their members in this cluster; followed by Organization of the Petroleum Exporting (6/10 members) and the Commonwealth of Independent States (all members).

Cluster 2

Cluster 2 is composed of 43 countries with a population of more than 4.1 billion people. The country closest to its centroid is Jamaica, followed by Poland, Morocco, Saudi Arabia and China. South Africa is the farthest country from the centroid, followed by Israel, Guatemala, Indonesia and Greece. It is important to note that the most populous countries in the world, China and India, are included in this cluster, both very close to its centroid. While Figure 26 illustrates that Brazil is the country closest to the centroid of Cluster 1. Those closest to Cluster 3 are Israel, Chile, Malta and Czech Republic. Chile (Cluster 2) and Estonia (Cluster 3) are the closest countries between the clusters.

As Cluster 2 is very near to the origin of the factors axes (the distance of the first factor to the centroid is 0.38237), this gives rise to non-significant results for most of the variables, as most of the results are very close to average values.

Under the regional and development criteria of the IMF, Latin America and the Caribbean, and Advanced economies are highly represented in this cluster; whereas by the income criteria of the World Bank, the High-Income and Upper-Middle-Income countries exhibit the highest frequency in the cluster. Following the perspective that focuses on economic and regional integration agreements, we can see that the OECD (13/35 members) and the European Union (with 11/28 members) have the highest frequency in Cluster 2. At a lesser frequency we find countries of the Pacific Alliance (all members).

Cluster 3

Cluster 3 is composed of 25 countries with a total a population of more than 848 million people. The country closest to its centroid is Austria, followed by Australia, Canada, United Kingdom and the Netherlands. The farthest country of the group is Taiwan, followed by Qatar, France, Estonia and the United Arab Emirates. Estonia is the closest country to Cluster 2.

Compared to Cluster 1, countries belonging to Cluster 3 exhibit opposite results: all the variables are significant, but with positive and high values, showing good performances in Economic outcomes, Human Capabilities, Liberties, Social Capital, Research and Innovation, and Ecological performance, with positive results in human development, liberties and opportunities for their citizens.

Using the regional and development criteria of the IMF, the Advanced Economies group is highly represented in this cluster. By the Income criteria of the World Bank, the High-Income group in the only one represented in this cluster. Looking at economic and regional integration agreements, the OECD (20/35 members) and the European Union (12/28 members) are highly represented in Cluster 3, followed by the Trans-Pacific Partnership (6/12 members).

When speaking on economic and regional integration agreements, the following should be noted: Of the 127 countries included in the IPRI-2017 selection, there are 13 that do not belong to any of the agreements chosen, 58 that belong to only one agreement, 50 countries that are members of two of them, and there are 5 countries that are members of three integration agreements, and one that is part of 4 of them. Also, there is a great disparity in the number of countries that are part of the agreements, some with many members (OECD has 35 members and EU has 28 members), others with just a few.

The Organization for Economic Co-operation and Development, European Union, Association of Southeast Asian Nations, Organization of the Petroleum Exporting Countries and the Trans-Pacific Partnership have members in the three clusters. The members of The Central African Economic and Monetary Community, Pacific Alliance, Commonwealth of Independent States, Caribbean Community and European Free Trade Association, belongs only to one cluster. The rest of the agreements have members in two clusters in different proportions.

The data suggests that most of the chosen integration agreements demonstrate some level of heterogeneity in terms of the strength of the property right systems among their members. In presence of homogeneity it would be easier for an integration agreement to promote common policies to enhance the strength of property rights. Heterogeneity could also be seen as an advantage, as the policies could be targeted to specific members of the agreement.

On the other hand, the integration agreements showing members in just one cluster reveal homogeneity amongst their countries' property right systems. Even those agreements participating in two clusters show members in cluster boundaries and could be seen as a possible transition from one cluster to the other.

In conclusion of the cluster analysis we find that:

- Each cluster represents more than a grouping by variables directly associated with property rights; they are groups with common characteristics within them and with different features among clusters, which confirms the consistency of the IPRI, and the relevance of property right systems influencing societies.
- Cluster 1 and Cluster 3 are two extreme poles in terms of the performance of their economies, human capabilities, social capital, research and innovation, ecological performance, their institutional stability, as well as their IPRI scores.

- Cluster 2 statistical values reflected its intermediate position and depending on the decisions taken in the present and near future of each country, will be inclined to one of the two polar classes. Those countries that keep their position very close to Cluster 1 should review their policies regarding property rights, as well as other dimensions to improve their economic performance and well-being of their citizens.
- Countries in Cluster 1 should particularly focus efforts on strengthening their legal and political environment to protect physical and intellectual property rights, which are still weak, in order to improve the quality of life in their societies.
- Countries in the boundaries between two clusters have to make special efforts to mind the gap, which will place them in a higher level.
- The displacement of cluster centroids between the 2016 and 2017 editions demonstrates the importance of each country to have a long-term view property right reform policies, that is, they must be able to continue reaching higher levels of property right protection, to avoid being left behind in the near future by world progress in this matter.

IX. Final Remarks

The methodology of the 11th edition of the International Property Rights Index is consistent with previous editions, revealing a proper structure for the index. In this sense, its follow-up in years ahead is crucial to monitor the performance of property rights systems and their relationship to prosperity within countries, regionally, and globally.

Results suggest that countries with high IPRI scores and its components also show high income and high development levels, indicating the positive relationship between property rights regime and wellbeing.

In this edition, we included a range of dimensions to be contrasted with property rights. Our results show that the IPRI is strongly associated with economic opportunities and liberties within countries, as well as their social cohesion, human capabilities, innovative research and the ecosystem.

Each of these dimensions was evaluated using different items: production (*per capita* level adjusted by inequality and composition), investment, entrepreneurship ecosystem, economic freedom, political rights, civil liberties, absence of coercion, propensity to connectivity, human development (current condition and future potential), freedom of education, minority group inclusion, civic activism, intergroup cohesion, interpersonal safety and trust, social capital, number of researchers, number of papers published, expenses in R&D and environmental performance. All the items showed a strong positive association with the IPRI and its components.

This way, IPRI results can be used as guidelines for policy makers in different countries - as in multilateral or integration agreements, to which they belong - to enhance their policies aimed to foster development, defined as a multidimensional and synergic term.

IPRI-2017 includes 127 countries with an average score of 5.6336, showing an increase of 0.1877 points (3.45%) compared to 2016. This edition includes three countries (Brunei Darussalam, Democratic Rep. of Congo and Rep/ of Yemen) that were not in the IPRI-2016, and four countries had to be excluded (Guyana, Haiti, Myanmar and Swaziland) due to the absence of enough information.

Country performance is quite dissimilar: we find countries with very high scores and others with very low scores. Once a country attains one of the top positions it mostly keeps it. We are glad to highlight five countries with an improvement over 0.5: Spain (0.57), Israel (0.56), Sweden (0.51), Ethiopia (0.51) and Lebanon (0.50). However, as some countries improve, others may show a

setback. This is the case of Cyprus (-0.6743), that this year shows the biggest recoil mainly as a result of a PPR decline (-1.8974).

IPRI-2017 keeps the calculations of IPRI-GE and IPRI-POP given the importance of showing the impact of gender equality and countries' demographic weight in analyzing property rights systems.

IPRI-GE was calculated for a total of 123 countries and 2017 average score is 7.44 showing a sustained improvement (2016=6.933; 2015= 6.76). This despite the GE score of 7.118 is lower than in former two years (2016=7.466; 2015=7.39), meaning that gender equality is deteriorating as an average, while property rights protection improves.

IPRI-POP was calculated for the 127 countries, the world average of 5.522 is an improvement compared to 2016 (5.45). This is due to the fact that 68% of world population lives in 66 countries with an IPRI between 4.5 and 6.4, insisting on the importance of fostering property rights systems in densely populated countries.

IPRI-2017 also included a cluster analysis, in order to gather countries in groups by their homogeneity. The 127 countries were classified according to their values in the IPRI and its three components in three clusters. The analysis of clusters' centroids and the countries by the boundaries between groups, provides important information about their characteristics and challenges. Cluster analysis also confirmed the consistency of the IPRI, since the assembled countries exhibited a high degree of homogeneity, showing the relevance of property rights systems in shaping societies.

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XI. Appendix

V1.1 APPENDIX I. DATA SOURCE, IPRI 2017

IPRI-2017	Data	Original Scale	Year	Source	Link	bitly
SUBINDEX: Legal and Political Environment (LP)	Judicial Independence	[1-7](best)	2016-2017	The Global Competitiveness Index Historical Dataset © 2007-2017 World Economic Forum	http://reports.weforum.org/global-competitiveness-index/downloads/	http://bit.ly/2Hs5Mn
	Rule Law	[(-2.5) - (2.5)]best	2015	The Worldwde Governance Indicators	http://info.worldbank.org/governance/wg/index.aspx#home	http://bit.ly/1rwuAb
	Political Stability	[(-2.5) - (2.5)]best	2015	The Worldwde Governance Indicators	http://info.worldbank.org/governance/wg/index.aspx#home	http://bit.ly/1rwuAb
	Control Corruption	[(-2.5) - (2.5)]best	2015	The Worldwde Governance Indicators	http://info.worldbank.org/governance/wg/index.aspx#home	http://bit.ly/1rwuAb
SUBINDEX: Physical Property Rights (PPR)	Property Rights	[1-7](best)	2016-2017	The Global Competitiveness Index Historical Dataset © 2007-2016 World Economic Forum	http://reports.weforum.org/global-competitiveness-index/downloads/	http://bit.ly/2Hs5Mn
	Registering Property	1-infinite Worst	2017	World Bank Group. Doing Business	http://www.doingbusiness.org/custom-query	http://bit.ly/2mm9poK
	Ease of Access to Loans	[1-7](best)	2016-2017	The Global Competitiveness Index Historical Dataset © 2007-2016 World Economic Forum	http://reports.weforum.org/global-competitiveness-index/downloads/	http://bit.ly/2Hs5Mn
SUBINDEX: Intellectual Property Rights (IPR)	Intellectual Property Protection	[1-7](best)	2016-2017	The Global Competitiveness Index Historical Dataset © 2007-2016 World Economic Forum	http://reports.weforum.org/global-competitiveness-index/downloads/	http://bit.ly/2Hs5Mn
	Patent Protection	[0-5](best)	2010	Giarte-Park (Patent Protection, 1960-2010) International Patent Protection: 1960-2005, Research Policy, Vol. 37, issue 4, 2008, pp. 761-766. Data	http://nw08.american.edu/~wgap/HPR	http://bit.ly/2mlYH1J
	Copyright Piracy Level	[0-100%]worst	2015	BSA Global Software Survey 2016	http://globalstudy.bsa.org/2016/downloads/studies/BSA_GSS_US.pdf	http://bit.ly/2m36pva
IPRI-POPULATION	Population	Thousands	2015	United Nations. Population Division. World Population Prospects: The 2015 Revision.	http://esa.un.org/unpd/wpp/Download/Standard/Population/	http://bit.ly/1K5abvg

X1.1 APPENDIX II. GROUPS CONFIRMATION. IPRI 2017

Class	Group	#	Countries
IPRI Regional Groups	A	27	BENIN;BOTSWANA;BURUNDI;CAMEROON;CHAD;CONGO, DEM. REP.;CÔTE D'IVOIRE;ETHIOPIA;GABON;GHANA;KENYA;LIBERIA;MADAGASCAR; MOZAMBIQUE;NIGERIA; RWANDA; SENEGAL;SIERRA LEONE;SOUTH AFRICA;TANZANIA, UNITED REPUBLIC OF;UGANDA;ZAMBIA;ZIMBABWE.
	AO	19	AUSTRALIA;BAHRAIN;EGYPT;IRAN;ISRAEL;JORDAN;KUWAIT;LEBANON;MOROCCO;OMAN;QATAR;SAUDI ARABIA;TUNISIA;UNITED ARAB EMIRATES;YEMEN, REP.
	CEECA	25	REPUBLIC;ESTONIA;GEORGIA;HUNGARY;KAZAKHSTAN;LATVIA;LITHUANIA;MACEDONIA, FYR; MOLDOVA; MONTENEGRO; POLAND; ROMANIA; RUSSIA; SERBIA; SLOVAKIA; SLOVENIA; TURKEY;UKRAINE.
	LAC	20	ARGENTINA;BOLIVIA;BRAZIL;CHILE;COLOMBIA;COSTA RICA;DOMINICAN REPUBLIC;ECUADOR;EL SALVADOR; GUATEMALA; HONDURAS; JAMAICA; MEXICO;NICARAGUA; PANAMA; PARAGUAY; PERU; TRINIDAD AND TOBAGO; URUGUAY;VENEZUELA, BOLIVARIAN REPUBLIC OF.
	MENA	15	ALGERIA;BAHRAIN;EGYPT;IRAN;ISRAEL;JORDAN;KUWAIT;LEBANON;MOROCCO;OMAN;QATAR;SAUDI ARABIA;TUNISIA;UNITED ARAB EMIRATES;YEMEN, REP.
	NA	2	CANADA;UNITED STATES (USA).
	WE	19	AUSTRIA;BELGIUM;DENMARK;FINLAND;FRANCE;GERMANY;GREECE;ICELAND;IRELAND;ITALY;LUXEMBURG;MALTA;NETHERLANDS;NORWAY;PORTUGAL;SPAIN;SWEDEN;SWITZERLAND; UNITED KINGDOM (UK).
	EUROPEAN UNION	28	AUSTRIA;BELGIUM;BULGARIA;CROATIA;CYPRUS;CZECH REPUBLIC;DENMARK;ESTONIA;FINLAND;FRANCE;GERMANY;GREECE;HUNGARY; IRELAND; ITALY; LATVIA; LITHUANIA; LUXEMBURG; MALTA; NETHERLANDS; POLAND;PORTUGAL; ROMANIA; SLOVAKIA;SLOVENIA;SPAIN;SWEDEN;UNITED KINGDOM (UK).
Prior 2016 IPRI Groups	REST OF EUROPE	14	ALBANIA;ARMENIA;BOSNIA AND HERZEGOVINA;GEORGIA;ICELAND;MACEDONIA, FYR;MOLDOVA;MONTENEGRO;NORWAY;RUSSIA;SERBIA;SWITZERLAND;TURKEY;UKRAINE.
	AFRICA	31	ALGERIA;BENIN;BOTSWANA;BURUNDI;CAMEROON;CHAD;CONGO, DEM. REP.;CÔTE D'IVOIRE;EGYPT;ETHIOPIA;GABON;GHANA;KENYA;LIBERIA; MADAGASCAR; MALAWI; MALI; MAURITANIA; MAURITIUS; MOROCCO; MOZAMBIQUE;NIGERIA;RWANDA;SENEGAL; SIERRA LEONE;SOUTH AFRICA;TANZANIA, UNITED REPUBLIC OF TUNISIA; UGANDA; ZAMBIA; ZIMBABWE.
	NORTH AMERICA	3	CANADA;MEXICO;UNITED STATES (USA).
	CENTRAL AMERICA&CARIB	9	COSTA RICA;DOMINICAN REPUBLIC;EL SALVADOR;GUATEMALA;HONDURAS;JAMAICA;NICARAGUA;PANAMA;TRINIDAD AND TOBAGO.
	SOUTH AMERICA	10	ARGENTINA;BOLIVIA;BRAZIL;CHILE;COLOMBIA;ECUADOR;PARAGUAY;PERU;URUGUAY;VENEZUELA, BOLIVARIAN REPUBLIC OF.
	ASIA	30	AZERBAIJAN;BAHRAIN;BANGLADESH;BRUNEI DARUSSALAM;CHINA;HONG KONG (SAR of China);INDIA;INDONESIA;IRAN;ISRAEL;JAPAN;JORDAN;KAZAKHSTAN;KOREA, REP.; KUWAIT; LEBANON; MALAYSIA; NEPAL; OMAN; PAKISTAN;PHILIPPINES;QATAR;SAUDI ARABIA;SINGAPORE;SRI. LANKA;TAIWAN (China);THAILAND;UNITED ARAB EMIRATES;VIETNAM;YEMEN,
	OCEANIA	2	AUSTRALIA;NEW ZEALAND.
	High income	49	AUSTRALIA;AUSTRIA;BAHRAIN;BELGIUM;BRUNEI DARUSSALAM;CANADA;CHILE;CROATIA;CYPRUS;CZECH REPUBLIC;DENMARK;ESTONIA;FINLAND;FRANCE;GERMANY;GREECE;HONG KONG (SAR of China);HUNGARY;ICELAND;IRELAND; ISRAEL;ITALY;JAPAN;KOREA, REP.;KUWAIT;LATVIA;LITHUANIA;LUXEMBURG;MALTA;NETHERLANDS;NEW ZEALAND; NORWAY; OMAN; POLAND; PORTUGAL; QATAR; SAUDI ARABIA; SINGAPORE; SLOVAKIA; SLOVENIA; SPAIN;SWEDEN;SWITZERLAND;TAIWAN (China);TRINIDAD AND TOBAGO;UNITED ARAB EMIRATES; UNITED KINGDOM (UK);UNITED STATES (USA);URUGUAY.
Income Classification	Low income	17	BENIN;BURUNDI;CHAD;CONGO, DEM. REP.;ETHIOPIA;LIBERIA;MADAGASCAR;MALAWI;MALI;MOZAMBIQUE;NEPAL;RWANDA;SENEGAL;SIERRA LEONE;TANZANIA, UNITED REPUBLIC OF;UGANDA;ZIMBABWE.
	Lower middle income	26	ARMENIA;BANGLADESH;BOLIVIA;CAMEROON;CÔTE D'IVOIRE;EGYPT;EL SALVADOR;GHANA;GUATEMALA;HONDURAS;INDIA;INDONESIA;KENYA;MAURITANIA; MOLDOVA;MOROCCO; NICARAGUA;NIGERIA; PAKISTAN; PHILIPPINES; SRI LANKA; TUNISIA;UKRAINE;VIETNAM;YEMEN, REP.;ZAMBIA.
	Upper middle income	35	ALBANIA;ALGERIA;ARGENTINA;AZERBAIJAN;BOSNIA AND HERZEGOVINA;BOTSWANA;BRAZIL;BULGARIA;CHINA;COLOMBIA;COSTA RICA;DOMINICAN REPUBLIC; ECUADOR;GABON; GEORGIA;IRAN;JAMAICA; JORDAN; KAZAKHSTAN ;LEBANON; MACEDONIA, FYR;MALAYSIA;MAURITIUS; MEXICO; MONTENEGRO; PANAMA;PARAGUAY;PERU; ROMANIA;RUSSIA;SERBIA; SOUTH AFRICA;THAILAND;TURKEY;VENEZUELA, BOLIVARIAN REPUBLIC OF.
	Advanced economies	36	AUSTRALIA;AUSTRIA;BELGIUM;CANADA;CYPRUS;CZECH REPUBLIC;DENMARK;ESTONIA;FINLAND;FRANCE;GERMANY;GREECE;HONG KONG (SAR of China) ;ICELAND; IRELAND; ISRAEL; ITALY; JAPAN; KOREA, REP.;LATVIA;LITHUANIA;LUXEMBURG;MALTA;NETHERLANDS;NEW ZEALAND; NORWAY;PORTUGAL; SINGAPORE;SLOVAKIA; SLOVENIA; SPAIN; SWEDEN; SWITZERLAND; TAIWAN (China);UNITED KINGDOM (UK);UNITED STATES (USA).
Region Classification	Commonwealth of Indepe	7	ARMENIA;AZERBAIJAN;GEORGIA;KAZAKHSTAN;MOLDOVA;RUSSIA;UKRAINE.
	Emerging and Developing	11	BANGLADESH;BRUNEI DARUSSALAM;CHINA;INDIA;INDONESIA;MALAYSIA;NEPAL;PHILIPPINES;SRI. LANKA;THAILAND;VIETNAM.
	Emerging and Developing	11	ALBANIA;BOSNIA AND HERZEGOVINA;BULGARIA;CROATIA;HUNGARY;MACEDONIA, FYR;MONTENEGRO;POLAND;ROMANIA;SERBIA;TURKEY.
	Latin America and the Cari	20	ARGENTINA;BOLIVIA;BRAZIL;CHILE;COLOMBIA;COSTA RICA;DOMINICAN REPUBLIC;ECUADOR; EL SALVADOR; GUATEMALA; HONDURAS; JAMAICA;MEXICO;NICARAGUA; PANAMA; PARAGUAY; PERU; TRINIDAD AND TOBAGO;URUGUAY;VENEZUELA, BOLIVARIAN REPUBLIC OF.
	Middle East, North Africa,	16	ALGERIA;BAHRAIN;EGYPT;IRAN;JORDAN;KUWAIT;LEBANON;MAURITANIA;MOROCCO;OMAN;PAKISTAN;QATAR;SAUDI ARABIA;TUNISIA;UNITED ARAB EMIRATES;YEMEN, REP.
	Sub-Saharan Africa	26	BENIN;BOTSWANA;BURUNDI;CAMEROON;CHAD;CONGO, DEM. REP.;CÔTE D'IVOIRE;ETHIOPIA;GABON;GHANA;KENYA;LIBERIA;MADAGASCAR;MALAWI;MALI;MAURITIUS; MOZAMBIQUE;NIGERIA;RWANDA;SENEGAL;SIERRA LEONE;SOUTH AFRICA;TANZANIA, UNITED REPUBLIC OF;UGANDA;ZAMBIA;ZIMBABWE.
Regional Integration Agreements	OECD	35	AUSTRALIA;AUSTRIA;BELGIUM;CANADA;CHILE;CZECH REPUBLIC;DENMARK;ESTONIA;FINLAND;FRANCE;GERMANY;GREECE;HUNGARY;ICELAND;IRELAND;ISRAEL;ITALY;JAPAN;KOREA, REP.;LATVIA;LUXEMBURG;MEXICO;NETHERLANDS;NEW ZEALAND;NORWAY;POLAND;PORTUGAL;SLOVAKIA;SLOVENIA;SPAIN;SWEDEN;SWITZERLAND;TURKEY;UNITED KINGDOM (UK);UNITED STATES (USA).
	EU	28	AUSTRIA;BELGIUM;BULGARIA;CROATIA;CYPRUS;CZECH REPUBLIC;DENMARK;ESTONIA;FINLAND;FRANCE;GERMANY;GREECE;HUNGARY;IRELAND;ITALY; LATVIA; LITHUANIA ;LUXEMBURG; MALTA;NETHERLANDS; POLAND; PORTUGAL; ROMANIA; SLOVAKIA;SLOVENIA; SPAIN;SWEDEN;UNITED KINGDOM (UK).
	SADC	10	BOTSWANA;CONGO, DEM. REP.;MADAGASCAR;MALAWI;MAURITIUS;MOZAMBIQUE;SOUTH AFRICA;TANZANIA, UNITED REPUBLIC OF;ZAMBIA;ZIMBABWE.
	ECOWAS	8	BENIN;CÔTE D'IVOIRE;GHANA;LIBERIA;MALI;NIGERIA;SENEGAL;SIERRA LEONE.
	ASEAN	7	BRUNEI DARUSSALAM;INDONESIA;MALAYSIA;PHILIPPINES;SINGAPORE;THAILAND;VIETNAM.
	PARLACEN	6	DOMINICAN REPUBLIC;EL SALVADOR;GUATEMALA;HONDURAS;NICARAGUA;PANAMA.
	GCC	6	BAHRAIN;KUWAIT;OMAN;QATAR;SAUDI ARABIA;UNITED ARAB EMIRATES.
	AP	6	CHILE;COLOMBIA;COSTA RICA;MEXICO;PANAMA;PERU.
	MERCOSUR	5	ARGENTINA;BRAZIL;PARAGUAY;URUGUAY;VENEZUELA, BOLIVARIAN REPUBLIC OF.
	SAARC	5	BANGLADESH;INDIA;NEPAL;PAKISTAN;SRI. LANKA.
	CEMAC	3	CAMEROON;CHAD;GABON.
	MCCA	5	COSTA RICA;EL SALVADOR;GUATEMALA;HONDURAS;NICARAGUA.
	CIS	6	ARMENIA;AZERBAIJAN;KAZAKHSTAN;MOLDOVA;RUSSIA;UKRAINE.
	ARAB M UNION	4	ALGERIA;MAURITANIA;MOROCCO;TUNISIA.
	CARICOM	2	JAMAICA;TRINIDAD AND TOBAGO.
	CAN	4	BOLIVIA;COLOMBIA;ECUADOR;PERU.
	EFTA	3	ICELAND;NORWAY;SWITZERLAND.
	IGAD	3	ETHIOPIA;KENYA;UGANDA.
	NAFTA	3	CANADA;MEXICO;UNITED STATES (USA).
	OPEP	10	ALGERIA;ECUADOR;GABON;IRAN;KUWAIT;NIGERIA;QATAR;SAUDI ARABIA;UNITED ARAB EMIRATES;VENEZUELA, BOLIVARIAN REPUBLIC OF.
	CEEAC	6	BURUNDI;CAMEROON;CHAD;CONGO, DEM. REP.;GABON;RWANDA.
	TPP	12	AUSTRALIA;BRUNEI DARUSSALAM;CANADA;CHILE;JAPAN;MALAYSIA;MEXICO;NEW ZEALAND;PERU;SINGAPORE;UNITED STATES (USA);VIETNAM.

X1.1 APPENDIX III. GE DATA SOURCE. IPRI 2017

	Data	Original Scale	Year	Countries #	Source	Link	Key statistical concept
Women's Access to Bank Loans	Access to financial services	0 (Best) 0.5 (Average) 1 (Worst)	2014	160	OCDE GID-DB	http://www.genderindex.org/	Measures whether women and men have equal access to financial services
Women's Access to Land Ownership	Secure access to land	0 (Best) 0.5 (Average) 1 (Worst)	2014	160	OCDE GID-DB	http://www.genderindex.org/	Measures whether women and men have equal and secure access to land use, control and ownership
Women's Access to Property Other than land	Secure access to non-land assets	0 (Best) 0.5 (Average) 1 (Worst)	2014	160	OCDE GID-DB	http://www.genderindex.org/	Measures whether women and men have equal and secure access to non-land assets use, control and ownership
Inheritance Practices	Inheritance: Widows	0 (Best) 0.5 (Average) 1 (Worst)	2014	160	OCDE GID-DB	http://www.genderindex.org/	Measures whether widows and widowers have equal inheritance rights
	Inheritance: Daughters	0 (Best) 0.5 (Average) 1 (Worst)	2014	160	OCDE GID-DB	http://www.genderindex.org/	Measures whether daughters and sons have equal inheritance rights
Women Social Rights	Parental authority: In marriage	0 (Best) 0.5 (Average) 1 (Worst)	2014	160	OCDE GID-DB	http://www.genderindex.org/	Measures whether women and men have the same right to be the legal guardian of a child during marriage
	Parental authority: After divorce	0 (Best) 0.5 (Average) 1 (Worst)	2014	160	OCDE GID-DB	http://www.genderindex.org/	Measures whether women and men have the same right to be the legal guardian of and have custody rights over a child after divorce
	Female genital mutilation	0 (Best) 0.5 (Average) 1 (Worst)	2014	160	OCDE GID-DB	http://www.genderindex.org/	Measures the prevalence of female genital mutilation.
	Access to public space	0 (Best) 0.5 (Average) 1 (Worst)	2014	160	OCDE GID-DB	http://www.genderindex.org/	Measures whether women face restrictions on their freedom of movement and access to public space
	Son preference in education	0 (Best) 0.5 (Average) 1 (Worst)	2014	160	OCDE GID-DB	http://www.genderindex.org/	Percentage of people agreeing that university is more important for boys than for girls

XI.1. APPENDIX IV. CORRELATIONS DATA SOURCES

Dimension	Variable / Index	Source	Link
Economic outcomes	GDP per capita (constant 2010 US\$)	World Development Indicators, World Bank	http://data.worldbank.org/indicator/NY.GDP.PCAP.XD
	GDP per capita (constant 2010 US\$) * GINI (*)	UNDP, UNO	http://report.hdr.undp.org/
	Gross capital formation (current US\$)	World Development Indicators, World Bank	http://data.worldbank.org/indicator/NE.GDI.TOTL.CD
	Gross capital formation (current US\$) + Per Capita (*)	UNO	http://esa.un.org/unpd/wpp/Download/Standard/Population/
	Economic Complexity	The Observatory of Economic Complexity	http://atlas.media.mit.edu/en/rankings/country/
Liberties	Global Entrepreneurship Index	The Global Entrepreneurship and Development Institute	http://thegedi.org/global-entrepreneurship-and-development-index/
	Index of Economic Freedom (Heritage)	The Heritage Foundation	http://www.heritage.org/index/about
	Economic Freedom of the World (Fraser)	Fraser Institute	http://www.freetheworld.com/
	Political Rights-Freedom in the World	Freedom House	https://freedomhouse.org/report-types/freedom-world
	Civil Liberties-Freedom in the World	Freedom House	https://freedomhouse.org/report-types/freedom-world
Human Capabilities	Human Freedom Index	CATO Inst., Fraser Inst., Liberals Inst. at Friedrich Neumann Foundation	https://www.cato.org/human-freedom-index
	The Networked Readiness Index (NRI)	The World Economic Forum, INSEAD	http://reports.weforum.org/global-information-technology-report-2015
	Freedom of Education Index	Foundation Novae Terrae	http://www.novae-terrae.eu/en/documents/847-freedom-of-education-index-research.html
	Human Development Index (HDI)	UNDP, UNO	http://report.hdr.undp.org/
	The Legatum Prosperity Index: Social Capital Component	Legatum Institute Foundation	http://www.prosperity.com/#/
Social Capital	Indices of Social Development: Civic Activism	International Institute of Social Studies	http://www.indsocdev.org/data-access.html
	Indices of Social Development: Intergroup Cohesion	International Institute of Social Studies	http://www.indsocdev.org/data-access.html
	Indices of Social Development: Interpersonal Safety and Trust	International Institute of Social Studies	http://www.indsocdev.org/data-access.html
	Indices of Social Development: Inclusion of Minorities	International Institute of Social Studies	http://www.indsocdev.org/data-access.html
	Research and development expenditure (% of GDP)	World Development Indicators, World Bank	http://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS
Research and Innovation	Scientific and technical journal articles	World Development Indicators, World Bank	http://data.worldbank.org/indicator/IP.RN.ARTC.SC
Ecological performance	Researchers in R&D (per million people)	World Development Indicators, World Bank	http://data.worldbank.org/indicator/SP.POP.SCLE.RD.P6
	Environmental Performance Index (EPI)	Yale University	http://epi.yale.edu/country-rankings

X1.1. APPENDIX V. CLUSTER INFORMATION, IPRI 2017

Country	Accr.	Cluster	Distance to Centroid	Country	Accr.	Cluster	Distance to Centroid	Country	Accr.	Cluster	Distance to Centroid
ALGERIA	DZA	1	0.09854	JAMAICA	JAM	2	0.06101	AUSTRIA	AUT	3	0.01955
EGYPT	EGY	1	0.09943	POLAND	POL	2	0.16111	AUSTRALIA	AUS	3	0.04364
MACEDONIA, FYR	MKD	1	0.12457	MOROCCO	MAR	2	0.26925	CANADA	CAN	3	0.08292
KAZAKHSTAN	KAZ	1	0.13185	SAUDI ARABIA	SAU	2	0.27645	UNITED KINGDOM (UK)	GBR	3	0.12310
ARGENTINA	ARG	1	0.13462	CHINA	CHN	2	0.28042	NETHERLANDS	NLD	3	0.13928
MALAWI	MWI	1	0.15211	HUNGARY	HUN	2	0.30655	GERMANY	DEU	3	0.14022
NICARAGUA	NIC	1	0.17978	INDIA	IND	2	0.31421	DENMARK	DNK	3	0.16399
CÔTE D'IVOIRE	CIV	1	0.21030	JORDAN	JOR	2	0.33305	LUXEMBURG	LUX	3	0.18074
MADAGASCAR	MDG	1	0.21554	BAHREIN	BHR	2	0.33374	HONG KONG (SAR of China)	HKG	3	0.21415
CAMEROON	CMR	1	0.22904	GHANA	GHA	2	0.36668	JAPAN	JPN	3	0.23466
SIERRA LEONE	SLE	1	0.25763	SPAIN	ESP	2	0.43791	SINGAPORE	SGP	3	0.24417
GABON	GAB	1	0.26455	SLOVAKIA	SVK	2	0.45346	UNITED STATES (USA)	USA	3	0.29460
IRAN	IRN	1	0.29259	RWANDA	RWA	2	0.46295	NORWAY	NOR	3	0.30984
NIGERIA	NGA	1	0.29298	COSTA RICA	CRI	2	0.46573	SWITZERLAND	CHE	3	0.33432
MOZAMBIQUE	MOZ	1	0.31060	KOREA, REP	KOR	2	0.47687	BELGIUM	BEL	3	0.34127
AZERBAIJAN	AZE	1	0.36227	BRAZIL	BRA	2	0.48810	ICELAND	ISL	3	0.40771
ETHIOPIA	ETH	1	0.37496	SRI LANKA	LKA	2	0.53893	IRELAND	IRL	3	0.41870
BOLIVIA	BOL	1	0.39367	PHILIPPINES	PHL	2	0.57048	FINLAND	FIN	3	0.42816
SENEGAL	SEN	1	0.40808	MALAYSIA	MYS	2	0.58999	SWEDEN	SWE	3	0.43944
ZIMBABWE	ZWE	1	0.43079	TRINIDAD AND TOBAGO	TTO	2	0.62556	NEW ZEALAND	NZL	3	0.57616
MAURITANIA	MRT	1	0.44540	MAURITIUS	MUS	2	0.67967	UNITED ARAB EMIRATES	ARE	3	0.58434
VIETNAM	VNM	1	0.44761	SLOVENIA	SVN	2	0.68060	ESTONIA	EST	3	1.02546
ARMENIA	ARM	1	0.47717	ITALY	ITA	2	0.70883	FRANCE	FRA	3	1.05194
ECUADOR	ECU	1	0.47916	COLOMBIA	COL	2	0.73913	QATAR	QAT	3	1.07482
CHAD	TCD	1	0.50220	PANAMA	PAN	2	0.74159	TAIWAN (China)	TWN	3	1.11952
BULGARIA	BGR	1	0.51444	KUWAIT	KWT	2	0.79054				
BOSNIA AND HERZEGOVINA	BIH	1	0.52027	OMAN	OMN	2	0.79819				
LIBERIA	LBR	1	0.58755	BOTSWANA	BWA	2	0.88479				
BENIN	BEN	1	0.59493	PERU	PER	2	0.90140				
TURKEY	TUR	1	0.68403	MALTA	MLT	2	0.97623				
DOMINICAN REPUBLIC	DOM	1	0.68898	THAILAND	THA	2	1.02020				
TANZANIA, UNITED REP OF	TZA	1	0.69720	UGANDA	UGA	2	1.03081				
EL SALVADOR	SLV	1	0.72941	LITHUANIA	LTU	2	1.05038				
SERBIA	SRB	1	0.73789	URUGUAY	URY	2	1.11271				
PARAGUAY	PRY	1	0.78627	PORTUGAL	PRT	2	1.13228				
MALI	MLI	1	0.78686	MEXICO	MEX	2	1.13246				
TUNISIA	TUN	1	0.78750	CZECH REPUBLIC	CZE	2	1.13569				
ZAMBIA	ZMB	1	0.82062	CHILE	CHL	2	1.16824				
KENYA	KEN	1	0.86278	GREECE	GRC	2	1.31937				
MONTENEGRO	MNE	1	0.89860	INDONESIA	IDN	2	1.35314				
CROATIA	HRV	1	0.95445	GUATEMALA	GTM	2	1.45076				
PAKISTAN	PAK	1	1.03833	ISRAEL	ISR	2	1.49244				
ALBANIA	ALB	1	1.09547	SOUTH AFRICA	ZAF	2	1.67632				
HONDURAS	HND	1	1.15736								
BURUNDI	BDI	1	1.18120								
RUSSIA	RUS	1	1.24571								
CONGO, DEM. REP.	ZAR	1	1.29631								
NEPAL	NPL	1	1.41795								
GEORGIA	GEO	1	1.46522								
LATVIA	LVA	1	1.64470								
ROMANIA	ROU	1	1.82616								
LEBANON	LBN	1	1.85203								
UKRAINE	UKR	1	2.07395								
VENEZUELA, BOLIVARIAN REP OF	VEN	1	2.17183								
MOLDOVA	MDA	1	2.23803								
BANGLADESH	BGD	1	2.41659								
BRUNEI DARUSSALAM	BRN	1	3.43039								
YEMEN, REP.	YEM	1	3.72530								
CYPRUS	CYP	1	3.90764								